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AGRICULTURE APPROPRIATION BILL

HEARINGS

BEFORE THE

COMMITTEE ON AGRICULTURE

HOUSE OF REPRESENTATIVES

SIXTY-FOURTH CONGRESS

FIRST SESSION

ON THE

AGRICULTURE APPROPRIATION BILL

WASHINGTON
GOVERNMENT PRINTING OFFICE
1916

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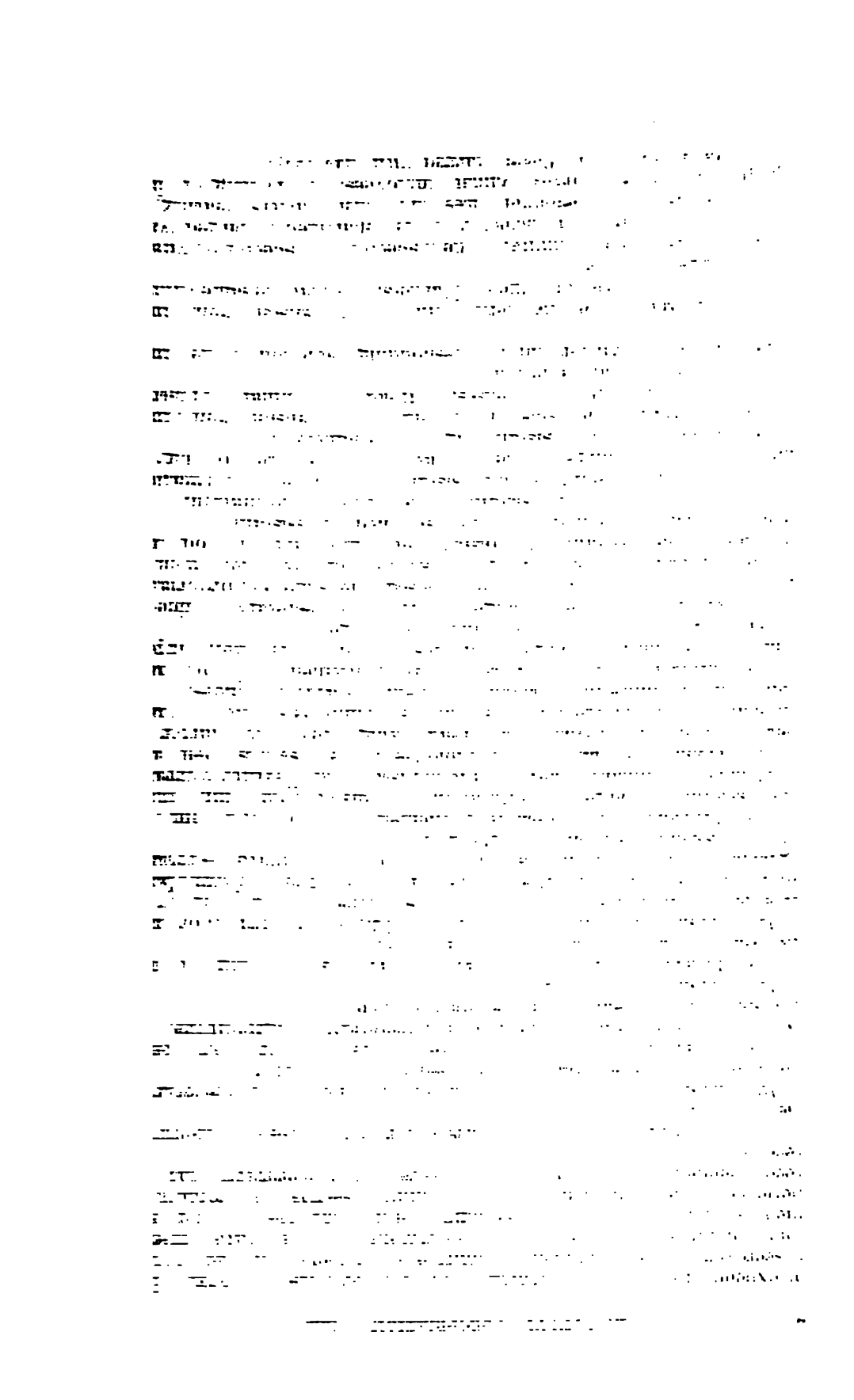

Mr. ANDERSON. These transfers do represent actual increases in the Secretary's force, do they not?

Mr. REESE. Yes, sir; in the Secretary's force. These employees have all been working for the Secretary—some of them for several years—under detail from the various bureaus by which they have been paid, such details being permitted by law.

Mr. ANDERSON. To what extent is the practice of detailing men from one bureau to another, from office to office, indulged in in the department?

Mr. REESE. It is not permitted except in the case of the Secretary's office and the library of the department. By the act of March 4, 1907, it is provided that such details may be made when necessary. Details are made from and to the office of the Secretary and from and to the library. Those are the only two cases I know of where details are permitted or practiced. In other words, it is not permissible to detail a clerk from one bureau to another.

Mr. ANDERSON. I knew it was a practice indulged in to a considerable extent in some of the departments, and I was wondering to what extent it was practiced in the Department of Agriculture.

Mr. REESE. Those are the only places where it is permitted.

The CHAIRMAN. All right, Mr. Reese. Take up item 28, increase of one clerk of class 4 in lieu of one clerk of class 3, with increase of $200.

Mr. REESE. The clerk who is increased there from $1,600 to $1,800 is acting chief clerk in the office of the Solicitor, which is a very responsible position. He is doing fully as responsible work as some of the chief clerks in bureaus having fewer employees and doing less volume of work. The amount of work in the Solicitor's office is constantly increasing. The chief clerk there has had no increase in salary since September, 1913. The change asked for would place him at $1,800 a year, which is below the salary paid to the chief clerk of any bureau (except two) in the department.

The CHAIRMAN. Any questions on that item, gentlemen. If not, we will take up item 29, 21 clerks, class 3, increase of two by transfer, etc. The same explanation, as to the transfer with same salary and corresponding reduction in the lump funds, go with that?

Mr. REESE. Yes, sir.

The CHAIRMAN. Is that true also of item 30? There seems to be three new places there. What about that?

Mr. REESE. In item 30?

Mr. HAWLEY. There is a net increase of two in item 29, also, Mr. Chairman.

The CHAIRMAN. Yes. What about that?

Mr. REESE. There were 10 clerks of class 3 in the bill for 1916. This provision adds three by transfer from lump funds of the Bureau of Animal Industry. One is dropped and added to item 28, making a net increase of two in item 29.

Mr. ANDERSON. You had 10 last year?

The CHAIRMAN. It is a net increase on this roll, but it is not a net increase so far as the whole department is concerned?

Mr. REESE. No, sir.

Mr. HAWLEY. It would be a net increase if this man were taken in.

Mr. REESE. The clerk just above there who goes from $1,600 to $1,800 makes a decrease in item 29 by changing one clerk to class 4.

This man just above, in item 28, is promoted. There is an increase in 29 by transfer of three from lump funds, but the net increase is two because one is changed to class 4.

Mr. HAWLEY. Were these men newly employed on the lump-fund roll?

Mr. REESE. No.

Mr. HAWLEY. They have been carried along for some time?

Mr. REESE. Yes, sir; they were both taken from the lump fund of the Bureau of Animal Industry.

Mr. HAWLEY. How many men who are transferred to the statutory roll of the Secretary's office were newly employed on the lump-fund rolls last year?

Mr. REESE. I could not tell that without looking up the dates of their appointments.

Mr. HAWLEY. Will you put that in the record, please?

Mr. REESE. Yes, sir.

(The statement referred to follows:)

Employees to be transferred to the statutory roll of the Secretary's office who were newly employed on lump funds during fiscal year 1915: One clerk, $1,400, from Office of Farm Management; one elevator conductor, $600, from Office of Public Roads and Rural Engineering; 1 unskilled laborer, $600, from Office of Public Roads and Rural Engineering; one elevator conductor, $600, from the Office of Markets and Rural Organizations; one mechanical superintendent, $2,500, from extra-labor roll, Office of Secretary; one watchman, $720, from extra-labor roll, Office of Secretary.

The CHAIRMAN. Anything further on that, gentlemen? If not, we will go on with item 30. I see there are three new places in item 30, Mr. Reese. Are these really new places or transfers?

Mr. REESE. They are three new places. Three of the six referred to are transfers; the other three are new places.

The CHAIRMAN. What is the necessity for those new places?

Mr. REESE. They are needed in connection with the greatly increased work of the Secretary's office and the Assistant Secretary's office. The work is growing all the time.

The CHAIRMAN. They would go to the Secretary and Assistant Secretary?

Mr. REESE. Yes, sir.

The CHAIRMAN. Any questions on that, gentlemen? If not, we will turn to page 8, item 31. That seems to involve only a transfer, Mr. Reese?

Mr. REESE. That is all.

The CHAIRMAN. I see you do not have a corresponding reduction there in the lump fund of the Secretary's office, do you?

Mr. REESE. No, sir; that is a small appropriation for emergency employments, $12,000, and it is of great importance to have that entire fund available. It should not be reduced by these transfers.

The CHAIRMAN. Anything on that, gentlemen? If not, take up item 34, one clerk by transfer from statutory roll, Office of Public Roads.

Mr. REESE. Same thing, sir.

The CHAIRMAN. Item 35, transfer of one clerk, at $1,020. Is that the same?

Mr. REESE. Yes, sir.

The CHAIRMAN. Item 36, seven clerks, at $1,000 each, increase of one by transfer from lump fund for meat inspection, Bureau of

Animal Industry, and decrease of one by transfer to statutory roll, of Office of Farm Management, making no change in number of places.

Mr. REESE. That is correct.

The CHAIRMAN. Item 37, twelve clerks at $900 each, an increase of four, one by transfer from lump fund for administrative expenses, Bureau of Animal Industry; one from statutory roll, Bureau of Chemistry; one from statutory roll, Forest Service; one from lump fund for road building and maintenance, Office of Public Roads; and one from lump fund for cotton-futures act, Office of Markets; and decrease of one by transfer to statutory roll, Library, making a net increase of four. Is that really a net increase or not?

Mr. REESE. Yes, sir; that is a net increase.

The CHAIRMAN. Is it a net increase for the Secretary's roll only or for the department?

Mr. REESE. It is a net increase for the Secretary's roll.

The CHAIRMAN. Only?

Mr. REESE. Yes; that is all. The funds of bureaus from which these transfers are made have been reduced accordingly.

The CHAIRMAN. Your next item is No. 40, twelve assistant messengers or laborers, at $720 each, increase of one by transfer of one unskilled laborer at $720 from lump fund for general administration, Forest Service, with change of title. Is that all?

Mr. REESE. Yes, sir.

The CHAIRMAN. All right. Item 41, one messenger or laborer, by transfer of one unskilled laborer at $660 from lump fund for food and drugs, Bureau of Chemistry. Is that a change of title only?

Mr. REESE. Yes, sir. The lump fund from which he is transferred is reduced accordingly.

The CHAIRMAN. The next item, No. 42, one mechanical superintendent, by transfer from extra-labor roll, Secretary's office, $3,000.

Mr. REESE. That $3,000 should be changed to $2,500. The person occupying the position receives only $2,500.

The CHAIRMAN. What does he do?

Mr. REESE. He is the officer who, by the appointment of the Secretary, has taken general charge of the mechanical end of the department—the power house, the supervision of the department's shops, the work of the electricians and the plumbers, and all lines of mechanical work involved in keeping up the department.

Mr. HAWLEY. How long was he carried on the extra-labor roll?

Mr. REESE. Since the first of December. You will notice that one chief engineer, at $2,000, has been omitted. In the opinion of the Secretary, the matter needed readjustment and he directed the engagement of this mechanical superintendent to take entire charge.

Mr. HAWLEY. Was he the same person who had been the chief engineer?

Mr. REESE. No, sir.

The CHAIRMAN. What became of the chief engineer?

Mr. REESE. He is no longer in the service of the department.

The CHAIRMAN. Does this man do the same work that the chief engineer used to do?

Mr. REESE. The same and a great deal more.

The CHAIRMAN. The same and a great deal more. Any further questions, gentlemen? If not, take up item 47. There seems to

a transfer there and a change in designation. A change of title, I see.

Mr. REESE. That is all it is—a change of title to conform to the work performed.

The CHAIRMAN. Item 48, three elevator conductors at $600 each. Is this just a change in designation or title?

Mr. REESE. Yes, sir. That applies to the transfer of one unskilled laborer from the lump fund for farm irrigation, Office of Public Roads; it applies to that one item only.

Mr. ANDERSON. Last year this item was increased by two elevator conductors.

Mr. REESE. Yes, sir.

Mr. ANDERSON. What do you do with this other one?

Mr. REESE. We have to employ additional elevator conductors to provide for the new building occupied by the Office of Public Roads. This building was taken over last spring. It has two elevators and we had to get an extra elevator man for that.

Mr. HAWLEY. Why is the elevator man for that office carried on the Secretary's roll?

Mr. REESE. It is desirable to have all elevator conductors on the Secretary's roll in order that the chief clerk and the mechanical superintendent may control them in matters of discipline and may shift them from one building to another as necessity requires.

Mr. HAUGEN. Is the Office of Public Roads in a new building?

Mr. REESE. Yes, sir; that office occupies a new building on Fourteenth Street, opposite the Willard Hotel. It is known as the Willard Building.

The CHAIRMAN. I see you have one construction inspector, $1,400, changed to one clerk of class 2. How can you make a clerk out of a construction inspector?

Mr. REESE. It is not the same man, sir. The place of construction inspector is now superfluous; now that this new mechanical superintendent has been appointed, there would be no need for it.

The CHAIRMAN. Then, he would go out, as an individual?

Mr. REESE. No; the individual has been put in as a skilled laborer, at $1,000.

Mr. ANDERSON. Demoted?

Mr. REESE. Yes, sir; we desired to retain the $1,400 place, but the title of the position is changed.

The CHAIRMAN. Item 52, three cabinetmakers or carpenters, at $1,100, increase of one by transfer from the statutory roll, Bureau of Animal Industry.

Mr. REESE. That is a mere transfer, with a corresponding decrease in the statutory roll of the Bureau of Animal Industry.

The CHAIRMAN. The next is item 60, five painters, at $900 each.

Mr. REESE. Yes, sir; the same thing.

Mr. HAWLEY. There is one above that, Mr. Chairman, in item 59.

The CHAIRMAN. Yes; that is one I did not see; a decrease of one submitted.

Mr. REESE. Yes, sir; the current act carries two painters, at $1,000. We have dropped one of those places as unnecessary.

Mr. HAUGEN. That is an actual decrease?

Mr. REESE. Yes, sir.

The CHAIRMAN. Next page, item 65, one tinner's helper, by transfer from lump fund for general administration, Forest Service.

Mr. REESE. That is a transfer of the same kind.

The CHAIRMAN. Item 68, 50 watchmen, at $720 each, an increase of 6 and 3 new places. Why are those new places necessary?

Mr. REESE. Those new places are needed to insure the proper care of the additional buildings taken on, including the one occupied by the Office of Public Roads. It takes a double shift of men to do it. The present act provides 44, this gives 6 more, making 50 in all, and they are all needed.

The CHAIRMAN. They are all needed?

Mr. HAUGEN. Because of the increase in the force of the department?

Mr. REESE. Because of the increase in the number of buildings, due, naturally, to the increase of the whole department.

Mr. HAUGEN. If a decrease in the number of buildings and a greater number employed under one roof, it would lessen the expense, would it not?

Mr. REESE. That is the theory, but it has not worked out that way in the department.

Mr. HAUGEN. That is why I asked you that question—whether the increase was due to the number of employees.

Mr. REESE. Yes, sir.

The CHAIRMAN. You don't claim that you are adding on six new watchmen; you are adding only three?

Mr. REESE. Adding three only. Three are by transfer from other places.

The CHAIRMAN. Item 69, four mechanics, at $1,200 each——

Mr. ANDERSON. Just a minute, while you are on that watchman item. There was an increase of four last year, wasn't there?

Mr. REESE. The act carries 44.

Mr. ANDERSON. An increase of two last year, then?

Mr. HAUGEN. Can you give the increase in the number of employees for the year?

Mr. HARRISON. On January 1, 1915, there were 16,233 employees on the rolls of the department, both in and out of Washington.

Mr. HAUGEN. How many in Washington?

Mr. HARRISON. About 3,600.

Mr. HAUGEN. The year before?

Mr. HARRISON. On July 1, 1914, both in and out of Washington, there were 16,061. There was an increase of 162 employees during the fiscal year 1915.

Mr. HAUGEN. And you find it necessary to increase the number of watchmen by three to take care of 162 people?

Mr. HARRISON. Not to take care of the people, but of the buildings. We have about 25 buildings.

Mr. HAUGEN. The buildings housing the people?

Mr. HARRISON. Yes, sir.

Mr. HAUGEN. But the number of buildings have been reduced, haven't they?

Mr. HARRISON. No, sir.

Mr. HAUGEN. My understanding was that the department hired a number of these smaller buildings, but that they were being given up, as it was believed these people could be cared for better in the larger

buildings and at less expense where a greater number could be housed under one roof.

Mr. HARRISON. I don't think it has worked out that way.

Mr. HAUGEN. But I understood you to say that the increase was only 162?

Mr. HARRISON. While there was no considerable increase in the number of employees, we endeavored to secure additional space to relieve an overcrowded condition which has existed for some time; some of the offices still are congested.

Mr. HAUGEN. But 162 people would not require much additional space.

Mr. RUBEY. You have watchmen there in the daytime: what do they do then?

Mr. HARRISON. Mr. Reese can answer that question. Mr. Rubey.

Mr. REESE. The increase in the number of watchmen is made necessary in order to take care of this new building occupied by the Office of Public Roads and Rural Engineering, on Fourteenth Street, but there have also been one or two smaller buildings which had to be taken on. We moved one office out of the new Munsey Building, where we had to pay a very high rental, and put them in the old Public Roads Building at a much lower rental.

Mr. ANDERSON. But you don't reduce the amount of rent you expect to pay?

Mr. REESE. No; but we have gained additional space for the department's work, which required larger space.

Mr. ANDERSON. What I don't understand is that, if you take a large number of employees out of the Munsey Building, why there is not some reduction in the rent item.

Mr. REESE. Because the money saved by giving up the place where we were paying a high rental was used for renting low-priced buildings in other places, to enable the department to get more space for the same amount of money.

Mr. ANDERSON. Other buildings have been rented, then, to take the place of the space rented in the Munsey Building?

The CHAIRMAN. You needed more space, and you didn't have the money, so you gave up the high-priced place in order to get the additional room?

Mr. REESE. Exactly; and we now have the room needed.

Mr. ANDERSON. What do these watchmen do around there in the daytime?

Mr. REESE. The watch force in the daytime is stationed at the doors to watch people who come in and go out; they are there to direct people where they want to go, as far as possible, and, in general, to watch the incomings and outgoings of the day.

Mr. ANDERSON. I have never found one yet that could direct me anywhere.

Mr. REESE. We are trying to remedy that in the Department of Agriculture by getting up a directory, so the watchmen will be able to tell any visitor where to go.

Mr. HAUGEN. The increase of 160 people seems to be out of all proportion to the increase in the watch force you are asking for. That is what I was trying to get at.

Mr. REESE. For several years the department was very much overcrowded and it has been necessary to rent more buildings.

Mr. HAUGEN. It was found necessary to provide for more space for each employee?

Mr. REESE. Yes, sir. In a room not half the size of this we frequently had to put 8 to 10 people, and we have even been criticized by the Public Health Service for allowing such conditions to exist.

Mr. HELGESEN. In how many more buildings does the department now house its employees than before?

Mr. HAUGEN. I don't think you can get at it by giving the number of buildings. We now have 8 or 10 separate buildings where before we had 2 or 3.

Mr. REESE. Since last year the department has taken on 1358 B Street, and the new building on Fourteenth Street for the Office of Public Roads. Those are the two principal additions.

The CHAIRMAN. These smaller buildings, many of them, did not have elevators, did they?

Mr. REESE. None at all; they were merely old dwelling houses.

Mr. ANDERSON. I have heard that you were paying a higher price for the B Street property than adjoining property was bringing. Is there anything in that?

Mr. REESE. We are paying a considerable rental for that building, but it is not excessive. It figures out about 41 cents per square foot, and, considering the fact that it is a modern, fireproof, office building, best adapted for our purposes, that is not high.

Mr. HAUGEN. How does it compare with the rent paid for the building across from the Willard?

Mr. REESE. It is higher; but the building opposite the Willard Hotel stood vacant for some time after the Department of Commerce moved out, and the owner was willing to rent it to the Department of Agriculture at a reduced rental, and it is a big bargain at the price we get it.

Mr. HAUGEN. How does that compare with rent paid for other buildings in that vicinity?

Mr. REESE. It is very low, sir.

Mr. HAUGEN. The building across from the Willard Hotel is much more expensive than the one you refer to on B Street?

Mr. REESE. No; I don't think so, sir.

Mr. HAUGEN. You have reference to the building opposite the Willard Hotel?

Mr. REESE. Yes, sir; I would say it was not on a par with the so-called Bieber building at 1358 B Street.

Mr. HAUGEN. Have you seen some of the floors in the new building?

Mr. REESE. In the Bieber building, at 1358 B Street?

Mr. HAUGEN. Yes, I have reference to the new building opposite the department building on B Street.

Mr. ANDERSON. What rent do you pay for those little places, like the place where you have the congressional seed distribution?

Mr. REESE. The rental of No. 1306 B Street SW. is $2,500 per annum.

Mr. HAUGEN. How does that compare with the rent paid for the adjoining building?

Mr. REESE. It is lower. It is a much less desirable building. It is not a modern, fire-proof building.

Mr. HAUGEN. I have reference to the residence buildings.

Mr. REESE. I do not know the rent of the residence buildings.

Mr. HAUGEN. You were referring to the seed distribution building.

Mr. REESE. Yes, sir; the building occupied by the seed distribution office, 1358 B Street. The rent of that is $2,500 a year; the rate per square foot is 21⅝ cents.

Mr. CRUMPACKER. How long have you been renting that building?

Mr. REESE. For many years.

Mr. CRUMPACKER. Paying the same price?

Mr. REESE. No; the price now is less than when we first took it—$500 less.

Mr. CRUMPACKER. You were paying last year what you were paying for some years before?

Mr. REESE. Yes, sir.

The CHAIRMAN. Have you a statement showing the rent situation in the department?

Mr. REESE. Yes, sir.

The CHAIRMAN. I do not know whether this is the place it should go in, but it ought to be in the record somewhere. I think we will ask Mr. Reese at the proper time to prepare a statement to go in the record.

Mr. HAUGEN. I would like to get that rent question straightened out some time.

The CHAIRMAN. There is an item covering the question of rent, and we will take it up then.

Mr. HAUGEN. Still, I would like to get through with this matter—the Willard Building, the property across the street from the Willard Hotel. Of course, that represents a much larger investment than the building on B Street, as the real estate on Fourteenth Street is worth several times as much as that on B Street. Have you any knowledge as to that?

Mr. REESE. I have no definite knowledge, but undoubtedly the price of land up there is higher.

Mr. HAUGEN. Still you pay a lower rent?

Mr. OVERMYER. The value of the rent depends on the convenience of the property for the purposes you want to use it.

Mr. REESE. Yes, sir; and the building at 1358 B Street was constructed just for the needs of the department.

Mr. HAUGEN. And it was planned exactly where we intended to put up the main department building; and, in order to carry out that plan, we will probably have to condemn that property and pay several times the price it is worth in order to obtain the site for the main building of the department.

Mr. REESE. I have very decided opinions on that subject whenever the committee desires to hear from me. I have been giving the matter considerable study.

Mr. HAUGEN. You mean as to the plan and style of building of the department?

Mr. RE[illegible]E. Yes, sir.

Mr. HAU[illegible] You mean not complete the plan as suggested?

M[illegible] W[illegible]ther we complete the plan or not.

M[illegible] [illegible]s plan suggested takes in this very building we [illegible]. There is no question about that.

[illegible] notice there has been an increase in the number of 160 for the year 1914–15. I wonder if Mr.

Harrison can give us the number of the new places provided for in the new estimates?

Mr. HARRISON. That information is included in the hearings of the first day of the Bureau of Animal Industry.

The CHAIRMAN. A long statement showing all the transfers from the lump fund to the statutory roll has already been placed in the record?

Mr. HARRISON. Yes, sir. It shows every case where the lump fund has been reduced and where it has not been reduced, and every new statutory place that has been suggested.

Mr. HOWELL. Do you show in the hearings an estimate of the number of these new places, taking the department as a whole?

Mr. HAWLEY. Yes, all that was submitted in typewritten form, and though not spoken here it has been put in the record.

Mr. HARRISON. Mr. Lever asked that it be put in the record, and that has been done.

Mr. HAUGEN. When you make a transfer from one bureau to another, does that open the way for another position at the same salary, as a general thing?

Mr. HARRISON. Within the bureau?

Mr. HAUGEN. For instance, a transfer is made from the Bureau of Animal Industry, a $2,000 position, to the Office of the Secretary. Does that open a $2,000 place?

Mr. HARRISON. No, sir; nowhere. In the case you put, the employee would be occupying the place in the Secretary's office, and it would be simply a question of putting him on the Secretary's roll. We take away from the Bureau of Animal Industry a sum equal to his salary. There is no place left open in the bureau. The man and the money are both transferred.

Mr. HAUGEN. Is it the practice in that bureau to put in another man at the same salary?

Mr. HARRISON. The man transferred has not been doing any work for the bureau; he has been working in the Secretary's office.

Mr. HAUGEN. What I was getting at is it the practice of the bureau?

Mr. HARRISON. That is not the practice.

Mr. HAUGEN. You don't promote another man?

Mr. HARRISON. No, sir; there is no position there to which he can be promoted.

Mr. HAUGEN. I wanted to know if it is the practice of the bureaus to promote somebody to these higher positions.

Mr. HARRISON. No, sir.

The CHAIRMAN. Take up 69, four mechanics at $1,200 each, a decrease of one by transfer to statutory roll, Office of Public Roads.

Mr. REESE. That is where the man has been on detail from the Secretary's office.

The CHAIRMAN. Item 70, one skilled laborer, by transfer from extra-labor roll. This involves simply the transfer of an employee—just a transfer?

Mr. REESE. Just a transfer.

The CHAIRMAN. Item 72, two skilled laborers at $840 each, one by transfer from statutory roll, Division of Publications, and one by transfer of one laboratory helper at $840 from statutory roll, Bureau of Animal Industry, with change of title. No change there except in designation?

Mr. REESE. None, except in designation.

The CHAIRMAN. And one skilled laborer in item 73 by transfer?

Mr. REESE. Same thing; yes, sir.

Mr. HOWELL. How many places in all are taken from the Secretary's extra-labor roll?

Mr. REESE. Six.

Mr. HOWELL. Without decreasing the amount in any case.

Mr. REESE. Without decreasing it in any case.

Mr. HAWLEY. Is that extra-labor employment a sort of revolving door through which a man comes in and then goes on to some statutory roll?

Mr. REESE. That is not the idea. This roll is to provide for emergency employments only.

Mr. HAWLEY. But those that come in on an emergency find a permanent emergency; is that it?

Mr. REESE. Not always; for example, we have extra watchmen at times, when our regular watchmen are absent sick or taking their annual leave. They are paid from this appropriation for extra labor and emergency employments.

Mr. HAUGEN. They don't come in under the classified service, do they?

Mr. REESE. No, sir.

Mr. HAUGEN. How many of them come in that way, and for what length of time? Does it amount to permanent employment?

Mr. REESE. A very large proportion of them are employed for only 12 days in the month. That keeps the whole item of monthly salary within $25. A longer employment is not permitted under the civil-service rules.

Mr. HOWELL. Has the appropriation always been spent?

Mr. REESE. Yes, sir; it was $14,000 two years ago.

Mr. ANDERSON. I would like to ask a question on item 72. There you have a transfer from the statutory roll, Division of Publications, and it is assumed that the statutory roll of the Division of Publications is reduced by that amount $840. I turn over to page 159 and find there this statement: "Seventeen skilled laborers, at $720 each (decrease of 1 by transfer to statutory roll of Secretary's office, and 2 new places, making a net increase of 1)." Now, I don't see the purpose of transferring the man from the Division of Publications if his place is immediately filled by two new men.

Mr. REESE. They are needed, as the notes state, for the work of addressing envelopes.

Mr. ANDERSON. What I don't get through my head is why you transfer this man at all. Why not say this: "Increase of one place," instead of beating about the bush in transferring him to the Secretary's roll and taking on two men in his place?

Mr. REESE. You notice the man transferred from the Division of Publications to the Secretary's office is at $840, and that the two new places are at $720.

Mr. ANDERSON. Then, this is in reality a promotion?

Mr. REESE. That is not the same man. The man taken over working for the Secretary's office.

Mr. ANDERSON. You have attempted in this to adjust the rolls, Secretary's statutory roll comply with the actual in his office; isn't that the fact?

Mr. REESE. Precisely.

Mr. HAUGEN. And when the division lets go of the $840 man, it takes on two others at $720?

Mr. REESE. Not exactly. We transfer a $840 place and a $720 place from Publications to the Secretary's office.

Mr. HAUGEN. And take on what?

Mr. REESE. Two at $720 in the Division of Publications, but this is a net increase of one only in that division.

Mr. HAUGEN. Well, that is what I said.

Mr. REESE. The $840 man has been working in the Secretary's office; this is merely a readjustment, under the usual rule of the Secretary's statutory roll.

The CHAIRMAN. In item 78, "one messenger boy transferred from statutory roll of the Forest Service." That is just a transfer?

Mr. REESE. Yes, sir.

The CHAIRMAN. Now, Mr. Reese, in your emergency fund of $12,000 just how much increase will there be by these transfers from it? It may be well to let us have that in the record.

Mr. REESE. Apparently the six employees taken from the emergency fund would cover it; their salaries aggregate $9,070.

The CHAIRMAN. So that would be an appropriation for extra labor of $21,000?

Mr. REESE. Yes, sir.

The CHAIRMAN. So it amounts to an increase in that item of $9,070?

Mr. REESE. Yes, sir.

The CHAIRMAN. Any further questions on the statutory roll, gentlemen?

Do you have charge of the statutory roll of Farm Management, Mr. Reese?

Mr. REESE. No, sir.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Tuesday, February 15, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. Gentlemen, turn to page 13 of the Book of Estimates, and we will take up the Office of Farm Management. Dr. Spillman is in charge of this work and will present the estimates. First of all, Doctor, take up your statutory roll.

STATEMENT OF MR. W. J. SPILLMAN, CHIEF OF THE OFFICE OF FARM MANAGEMENT.

Mr. SPILLMAN. May I ask, Mr. Chairman, whether you want to take up the estimates as originally submitted by the Secretary? I understand there have been supplemental estimates submitted. Do you prefer me to take them up as submitted originally or in their supplemental form?

The CHAIRMAN. I had a letter on that matter from the Assistant Secretary of Agriculture, Dr. Vrooman, day before yesterday, but I have not had the time to look that over.

Mr. SPILLMAN. It is immaterial to me.

The CHAIRMAN. I presume, however, if that is the latest word of the department on the statutory roll, that you had better take it up as you have finally submitted it and make a general statement about it.

Mr. SPILLMAN. You want first a statement regarding the statutory roll?

The CHAIRMAN. Yes; but before you begin: This is the second time you have had a statutory roll?

Mr. SPILLMAN. Yes.

The CHAIRMAN. This fiscal year is the first time that you have had a statutory roll?

Mr. SPILLMAN. Yes; heretofore we have been merely a division of another bureau, and the statutory roll upon which our people were employed was the statutory roll of the bureau and not of the office. When we were transferred to the Secretary's office this last year it was necessary then to establish a statutory roll and to take the people who were in our office and previously on the statutory roll of the Bureau of Plant Industry. They were transferred to the Secretary's office and placed on the statutory roll of the Office of Farm Management.

I will explain that at that time we made as few changes as possible because of the greater change which was being made; that is, the

office was being moved from one bureau to another, and we made as few changes—in fact, made no changes in the statutory roll last year, except merely the transfers necessary to that separation. This year, in order to comply with the wishes of the committee, as expressed last year, we have put on our statutory roll in these estimates the clerical employees who last year were on our lump fund.

The CHAIRMAN. Your policy in transferring from the lump fund to the statutory roll has been to transfer all of your clerical positions on the lump fund to the statutory roll. I wonder if you have not gone a little further and transferred all of your permanent non-scientific positions on the lump-fund roll to the statutory roll, leaving under your lump fund only scientific men and temporary employees. Is that correct?

Mr. SPILLMAN. That is correct, Mr. Chairman.

The CHAIRMAN. And that is correct in all cases?

Mr. SPILLMAN. Yes; that is true in all cases. Also, in complying with the expressed wish of the committee, we have made the following transfers from the lump sum to our statutory appropriation. I will say that the estimates I am discussing now are the supplemental estimates submitted by the Assistant Secretary a few days ago; there were a few changes in the supplemental estimates as compared with the ones printed in the book.

In order to comply with the wishes of the committee, we have made the following transfers from the lump sum to the statutory roll: First, my own salary as chief of the office has been transferred to the statutory fund. There is one computer at $1,400 which we have changed to the title of "clerk"; that is a transfer from the lump fund to the statutory fund.

The CHAIRMAN. Before that, you have "one executive assistant," have you not?

Mr. SPILLMAN. That is not in the supplemental estimates submitted by the Assistant Secretary. That was in the original estimates.

The CHAIRMAN. Go ahead, then.

Mr. SPILLMAN. Of course, it is a matter for the committee to decide whether that shall be done. You will notice in the second transfer—the computer—there is a request for a change of designation. That is in order to facilitate organization in the office. "One computer at $1,400" is the only position of that character which we have. If he should leave us for any reason we might be able to get another computer, a younger man with less experience and therefore worth less, for $1,000. But if this is the only position we have for a computer we would be compelled to pay him $1,400. It would facilitate our organization and lead to a saving of money to the Government to be able to call that position a clerical position, because computing work is in reality a type of clerical work; there is no especial reason for making a special class of clerk to do computing work.

Then there are two clerks at $1,100 each, one at $1,080, two at $1,000, three at $900, one clerk and map tracer, one lantern-slide colorist, one laborer, one laboratory assistant, one photographer, one draftsman at $1,200, and two draftsmen at $900 each. Those are all simply transfers without the change of a cent in salary; and the positions in the lump fund have been deleted or taken out.

In addition to that, we are asking for the following new statutory places: One draftsman, at $1,440. Later, when we come to consider

[illegible]

[illegible]

[illegible]

Mr. SPILLMAN. They are permanent employees, but they are now on the lump fund and we want to put them on the statutory fund.

The CHAIRMAN. Take up your general line of work, Doctor.

Mr. SPILLMAN. As you have seen, the total new appropriation asked for under our statutory roll is $860. In our lump fund the secretary has submitted an estimate for an increase of $22,140 (that is our lump-fund estimate submitted), making a total increase of appropriations for the office of $23,000. As you will see, that is slightly different from the printed estimates. It is smaller than it is in the old estimates. One reason, by the way, for submitting this supplemental estimate was that it was found possible to save money and make the increase in the appropriations a little less than by the old system and still leave good organization in the office.

The CHAIRMAN. Suppose you take up item 108, page 16, of your Book of Estimates, "To investigate and encourage the adoption of improved methods of farm management and farm practice." If you have a program book there you will find your work set out on page 6, and the committee has adopted the policy of following the projects as set out in this program book, so as to give us a pretty good idea of what you are doing. I would like you to discuss each of those projects or to have the gentleman in immediate charge do so, as you may desire.

Mr. SPILLMAN. I want to make the discussion as brief as possible, Mr. Chairman. I realize that this committee has a pretty big task and must be rather wearied of this work, and, so far as I can, I will give the discussion myself, and where I can not I will call on the men in the office.

First, we will take up "Crop economics." That is the first item under this program of scientific work in the office. I am going to give you brief, concrete, statements of the nature of this work. By "Crop economics" we mean the position of the crop in the system of farming and the utilization of that crop on the farm, as well as the cost of producing the crop.

Here is one instance which to me is very interesting. One of our men this past season found several farmers in Arizona who were using a method of pasturing alfalfa which had a number of commendable features and which was of such value that we issued a little circular about it. There are two difficulties in pasturing alfalfa. One is bloat of cattle and sheep. There is very little trouble from bloat with horses or hogs. The other one is that the alfalfa, being kept eaten down close for a considerable period, is killed out in spots. The field becomes very spotted, and it becomes necessary to plow up the field. It is usually difficult to get a stand of alfalfa immediately following alfalfa. So the custom is to plow up the field, to grow other crops for a year or two, and then to plant it back to alfalfa. Mr. Clothier of our office discovered a method of pasturing alfalfa in use on several farms in Arizona, described in this circular [indicating], which obviates clearly the latter difficulty and gives the full use of the alfalfa as pasture without any injury whatever to the stand. He found fields that had been pastured for 10 years and had yielded twice as much pasture as under the ordinary method of pasturing, without any injury whatever to the stand of alfalfa. The loss from bloat under this system of pasturing is also reduced. Out of 141 animals pastured for 12 months there were

only three deaths from bloat, which is about half of the ordinary percentage.

The system is this: The farm is divided into relatively small fields and each field is allowed to grow until it is ready to cut for hay. Then a sufficient number of cattle are turned in to eat the alfalfa, say within 10 days or 20 days at the outside, so as to eat it down quickly. The cattle are then taken off the field and the field is irrigated and allowed to grow up again. When it is ready to cut for hay again the cattle are turned back. In this way, you see, the cattle are shifted around the farm, applying a system of rotation to pasture. This is in the Salt River Valley, Ariz. One of those farms had 140 acres of alfalfa, and here are some of the results secured. This farm of 140 acres maintained the equivalent of 141 full-grown animals for 12 months and produced a surplus of hay and feed which sold for $1,860, in addition to producing full feed for 141 head of cattle for 12 months, or more than one cow to the acre. And on this farm the stand of alfalfa is being maintained. There are no noxious weeds and the soil is always in the best of condition, owing to the absence of stock on the fields when they are wet. We feel that that is a rather important discovery.

I may say that the Office of Farm Management was founded on the idea that many farmers know a great deal about their business, and that of the 6,000,000 farmers in America all are experimenting more or less, and occasionally, here and there, discover something of importance. And it has been, and we hope always will be, the function of the Office of Farm Management to visit among the farmers and gather up their experience and interpret that experience for other farmers, believing that we can render valuable service in that way.

Perhaps the central idea in the Office of Farm Management is to find out how much money the farmers are making, how they make it, and why they make it. We have been able, by using census data and factors worked out in our research work, to determine the following facts:

The average farmer in the United States produces crops to the value of $511, exclusive of crops fed to live stock.

The value of the live-stock products on the average farm is $177.

The value of the animals sold and slaughtered is $288.

The value of the house rent, food, and fuel consumed by the family and not reported by the census is $260.

The gross earnings of the farm and the farm family, that is, of the capital and labor, is $1,236. The expenses total $512, made up of $80 maintenance charges, and miscellaneous items amounting to $430, making the net earnings of the farm and farm family $724. Esti- n ing that the property should earn 5 per cent, the property earn- in; are 22, and deducting that from the earnings of the average ; n 1 farm family, we have for the earnings of the farm family ing what the farm furnishes toward the family living.

1 IRMAN. The family, I believe, consists of five members,

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:MAN. It is the equivalent of about 4.6 grown people;

? ent of about 4.6 grown people having an income for

1 uding what they get from the farm in the way of and things of that character, of $402. In addition

to that they get $322, which represents the interest on their investment; out of which a considerable number of them who have mortgages must pay the interest on their mortgage.

The CHAIRMAN. Let us see if we get what you mean. Your figures, then, show that the net earning capacity of the average farm family in the United States is how much?

Mr. SPILLMAN. $402.

The CHAIRMAN. $402?

Mr. SPILLMAN. Yes.

Mr. CANDLER. And that farm family consists of 4.6 grown people?

Mr. SPILLMAN. The equivalent of 4.6 grown people.

Mr. CANDLER. That is an average of $100 a year for each one, then?

Mr. SPILLMAN. Just about.

Mr. RUBEY. You have used the term "net earning capacity." That might indicate that they could not do any better than that?

Mr. SPILLMAN. I did not mean, Mr. Rubey, that that was their earn ng capacity.

Mr. RUBEY. You mean that that is what they have done?

Mr. SPILLMAN. Yes, sir; that is what they have earned.

Mr. HOWELL. And you have deducted from that their living expenses?

Mr. SPILLMAN. No; that is included in that $402.

Mr. HOWELL. You have charged them up in this with all they have consumed off the farm?

Mr. SPILLMAN. Yes; that is counted as part of the salary and included in that $402.

Mr. HAWLEY. Have you taken it for granted that every farm furnishes the family with wood?

Mr. SPILLMAN. Yes; and with vegetables, milk, and things of that kind. That is all included in this $402, and that is the wages that they get.

Mr. HAWLEY. Does every farm furnish the family with wood?

Mr. SPILLMAN. Not every farm, but a good many farms furnish a great deal more. We have a bulletin, which I will take up a little later, in which it is shown that the amount of food, fuel, and house rent furnished by the farm is $421.

Mr. REILLY. Then the average farmer does not make anything?

Mr. SPILLMAN. The average farmer, for his wages——

Mr. REILLY. Gets nothing.

The CHAIRMAN. Less than nothing.

Mr. SPILLMAN. No; he gets a good deal to eat and a house to live in.

Mr. REILLY. I mean he gets nothing above his living?

Mr. SPILLMAN. He does not quite get that. His living is $420, and he gets $402.

Mr. REILLY. I do not know where you get those statistics, but in my section of the country they would not hold true.

Mr. SPILLMAN. There are many sections where they will not hold true.

Mr. LESHER. Have you given out that information to the public? If you have, I do not believe you will induce many people to go back to the farm.

Mr. SPILLMAN. We do not want to induce people to go back to the farm. We believe it is a mistaken idea to induce city people to go back to the farm—people who have more to learn than would the

farmer who goes to the city to be a lawyer or a banker. This idea of getting city people to go out on the farm, from the viewpoint of the Office of Farm Management, is a serious error.

The CHAIRMAN. You are promoting the stay-on-the-farm movement?

Mr. SPILLMAN. Yes, sir; the stay-on-the-farm movement and not the back-to-the-farm movement. I have the facts here. It is true there are a great many people who do not believe these facts, but they are facts, nevertheless.

The CHAIRMAN. I want to ask you a few questions in that connection. This is a little against our rule, which is that the gentleman be allowed to complete his statement before asking questions, but this is so very interesting. How do your figures compare with the figures of the Census Bureau?

Mr. SPILLMAN. These are mostly Census Bureau figures. Most of the figures here are taken from the Census Bureau.

The CHAIRMAN. In your investigations in the field, have those investigations verified to a large extent the accuracy of the census figures?

Mr. SPILLMAN. Yes, sir; to a very large extent. I have an instance right here in which I can show you how nearly they verify the census statistics. This is a farm-management pamphlet for Chester County, Pa., which I took the liberty of sending to each of you gentlemen some two weeks ago, because it shows particularly the most important type of work we are doing. I knew you had to consider this work, and I thought you would appreciate it.

The CHAIRMAN. We do, but unless you write a little note and call our attention to it we never see it.

Mr. SPILLMAN. I did, Mr. Chairman, knowing that you get barrels of material which you can not possibly read. I will read you the figures that were obtained in our survey. They present the crop acreage for these 626 farms in Chester County, Pa., as compared with the census figures for the whole county. There is a little difference. The section of the county in which we made our survey was the richest part of the county, and there are some slight differences between that and the rest of the county; but there is, in general, an agreement between our figures and the figures of the Census Bureau.

The percentage of corn acreage, our survey, was 22.3; the census figure for the whole county was 22.1.

Potatoes, our survey, 6 per cent of the acreage was in potatoes; for the whole county 4.80. We know that potatoes are grown a little more in the region where we surveyed than they are in the rest of the county. So we believe both of these figures are very accurate.

Wheat, 18.2 and 18.

Oats, 6.4 and 9.9 per cent. We now that there is a difference with respect to the oat acreage in this area and the rest of the county, and we know the reason why that difference exists. So we believe both of these figures are accurate.

Hay, in this region, 44; for the whole county, 39. We know that there is a difference of that character between this region and the rest of the county.

Fruit, 2.5 and 2.8.

The other acreages are too small to be of any significance.

That shows the general agreement between the results of our survey work and the results of the census.

The CHAIRMAN. Does the Census Bureau give figures on the net earnings of the average farm property?

Mr. SPILLMAN. They do not give the figure, Mr. Chairman, and in order to get that we had to take certain data furnished by the census and supplement that with information which we had gotten in our surveys, which the Census Bureau did not have.

The CHAIRMAN. Have you that information as to the net earnings of the average family segregated by sections?

Mr. SPILLMAN. We have it by States.

The CHAIRMAN. You have it by States?

Mr. SPILLMAN. Yes. We have it by counties, too, Mr. Chairman, but we do not think it desirable to give out that information.

The CHAIRMAN. Would there be any objection to giving it out by States?

Mr. SPILLMAN. There would be, for this reason: There are several States in which instead of $402, the figures climb up to a minus quantity, and those States would object to that information being given out.

Mr. REILLY. Have you ever made any comparison as to what the ordinary business men make or have as the result of a year's work?

Mr. SPILLMAN. Yes, sir.

Mr. REILLY. Is it not a fact that you will find as many failures in the business world as you do in the farm world?

Mr. SPILLMAN. We find a somewhat larger percentage, for this reason: The farmer does get green vegetables, fruit, milk, butter, poultry, eggs, fuel, and a house to live in from his farm; and it is pretty hard to run a man into bankruptcy under those conditions.

The CHAIRMAN. The death agony is just a little bit longer drawn out; is not that the fact?

Mr. SPILLMAN. Yes, it is longer drawn out, and for that reason a larger percentage of them do not go into the bankruptcy courts. However, the average conditions of living on the farm are not as comfortable as the average conditions of living in the city; because the average earnings of the farmer are not equal to the average earnings of the man in other lines of business.

Mr. REILLY. Of course, there is this fact, too, which the farmer has in his favor, that his plant is generally increasing in value.

Mr. SPILLMAN. That is not an advantage to the farmer; it is a disadvantage.

Mr. REILLY. A disadvantage?

Mr. SPILLMAN. Yes, sir. Every dollar added to the price of the land is a burden laid on agriculture.

Mr. REILLY. I do not quite understand that philosophy. I think it is a burden laid upon the community, but I can not see that it is a burden laid upon the man who owns the land.

Mr. SPILLMAN. It increases the taxes.

Mr. REILLY. But not in proportion to the increase of the value of the land.

Mr. SPILLMAN. Yes; but he does not benefit from the increased value of the land unless he sells it.

Mr. REILLY. But he sells it, and that is what keeps him from the bankruptcy court.

Mr. HAWLEY. But the next man assumes the burden.

Mr. REILLY. That is a different proposition. To the man who wants to become a farmer—it is a handicap to him.

Mr. SPILLMAN. When he quits being a farmer, then he gets the advantage.

The CHAIRMAN. Mr. Reilly is not making any distinction between the land farmer and the land speculator?

Mr. SPILLMAN. Yes; in order to realize on that increase in capitalization, the man must become a speculator; he does not realize on it as a farmer.

Mr. REILLY. Let me give this illustration: I know a man in my home section who purchased a farm 10 years ago for $6,000. That farm to-day is worth $12,000. He can raise on that farm, without selling it, $2 for every one he could raise 10 years ago.

Mr. SPILLMAN. Yes, sir; he can borrow more money; there is that advantage.

Mr. REILLY. Well, land in Wisconsin and Illinois has gone up 100 per cent in the last 15 years.

Mr. SPILLMAN. Yes; and much more than that in parts of those States.

Mr. RUBEY. He can not raise any more on his land, but he is that much further away from the bankruptcy court, because his capital investment has appreciated.

Mr. SPILLMAN. I appreciate that, that he is further away from the bankruptcy court and it gives him a larger basis for borrowing money; but it is not always a safe thing for a farmer to borrow money.

Mr. HOWELL. Is it not a fact that farm property always advances because of the increase of productiveness of the farm?

Mr. SPILLMAN. Oh, no. In the State of Iowa, the production——

Mr. HOWELL. I did not mean increased production of the farm, but increase of money returns from the farm——

Mr. SPILLMAN. Sometimes it is.

Mr. HOWELL. Due to increased prices for the farm products.

Mr. SPILLMAN. Sometimes that is true.

Mr. HOWELL. In other words, an increase earning value of the farm.

Mr. SPILLMAN. Sometimes that is true, but it is not always true. I can give you an instance where land is to-day capitalized at an average of $1,000 an acre where it is earning interest on $300 an acre. It is being sold readily, by misrepresentation of course, at $1,000 to $4,000 an acre where it is earning an average interest on only $300 an acre. Those facts are contained in these data I am speaking about here, and that is the reason we think it unwise to publish it—because these real-estate promoters are a very active lot of men.

Mr. HELGESEN. Do you mean to say because a certain number of men are active that the department does not dare to tell the truth, [illegible] it to do, to 100,000,000 people?

[illegible]AN. No; I would hardly think that is it. We believe [illegible]blish what is needed in such cases in another way and [illegible] difficulty.

[illegible] I would like to see that tried.

[illegible]at is a remarkable statement—that the depart[illegible]e out the truth.

Mr. SPILLMAN. It can do so, but it is not always wise to tell everything you know.

Mr. STEELE. I would like to ask a question. You have determined, Doctor, that these land values have reached a price where they will not increase for several years?

Mr. SPILLMAN. They should not increase.

Mr. STEELE. In other words, the farmer has bought his land and secured his profits by borrowing on his farm until he has mortgaged and remortgaged to the limit, and the present price of his land he has consumed in the last 20 years, so that now it is going to be a hardship for him to pay the interest on this increased value?

Mr. SPILLMAN. Yes; and I will say that in many parts of the country the prices of land are so high that if a man buys a farm at the current prices and goes in debt for it as much as he can, which is usually about three-quarters of the value of the farm, he can not, unless he is a very extraordinary man, pay for that farm at all; and I can mention wide ares of the country in the United States of which that is true.

The CHAIRMAN. These figures which you are giving to the committee this morning, and which have been more or less given to the committee heretofore in the testimony taken this year, are absolutely startling.

Mr. SPILLMAN. Yes, sir; they are.

The CHAIRMAN. And now that you have gotten together such a picture, and it is a very gloomy picture, have you a remedy?

Mr. SPILLMAN. Yes, sir.

The CHAIRMAN. All right, sir; let us have that.

Mr. SPILLMAN. Yes. I will say this, that the Office of Farm Management is working for this poor fellow who is getting $402 a year for the labor of himself and his family. That is the man we have in our mind's eye in our work in the Office of Farm Management. Now, we have a remedy; but it is not the remedy which has been generally recommended for the farmer.

Let us study some fundamental facts for a few moments. Let us see what effect it will have upon the farmer if we help him to organize in such a way that he can greatly reduce the expenses between his farm and the consumer. I will illustrate by using the apple growers of the Pacific northwest, with whom I am pretty well acquainted, having lived in that country for several years. Fifteen or twenty years ago the apple growers out there were making all kinds of money. I know of certain acres of land out there in apple-bearing trees that have sold as high as $4,000 an acre and at the time were paying interest on that valuation. But on account of the profitableness of the enterprise, other people planted apples, and there were a few years when the nurseries of the United States could not supply the demand for apple trees. In fact, Washington, Oregon, and Idaho would have planted, if they could have gotten the trees, in one or two years more apple trees than were grown in all of the nurseries of the United States, to say nothing about the rest of the country; and the rest of the country was as feverish to plant as was the Pacific Northwest. In other words, there was not one-fourth enough trees for planting. The profitableness of the business caused an increase in planting, and pretty soon there began to be overproduction, and the price of apples fell until a few years ago those beautiful apples

found out in Wenatchee, Wash., and the other fine, beautiful apples from Hood River would not have sold for enough in the eastern markets to pay the freight and to pay interest on the investment, to say nothing of the wages of the farmer. They saw there was something the matter. They went to work and formed an organization; they employed some very competent men and formed a really wonderful organization with a view to marketing in larger quantities and reducing the expense between the producer and the consumer. The next year after they formed that organization they made handsome profits. Prosperity had returned again. But, meanwhile, those trees which had been planted during the feverish times of tree planting were coming into bearing, and with all of this organization to market their apples at a minimum of expense, to advertise their fruit, as you gentlemen all know the Wenatchee apple is advertised (and it is worth advertising—there is no superior fruit so far as looks are concerned), what has happened to-day? With all of this organization, the profits of the industry stimulated production to the point where to-day apples will not sell for enough to pay the freight.

Mr. HAWLEY. Is not that due somewhat to the closing of the European markets to the apple producers?

Mr. SPILLMAN. The European market takes only a very small fraction of our crop.

Mr. HAWLEY. Did not those people sell them to that European market?

Mr. SPILLMAN. Not to any particularly great extent. They did sell some, but not enough to have much influence.

Mr. HOWELL. Is there not a very great lack of efficiency in the distribution of the apple crop?

Mr. SPILLMAN. Taking it as a whole, there is.

Mr. HOWELL. For instance, if people could buy apples as they buy bananas, would there not be an increase in the consumption?

Mr. SPILLMAN. I suppose it would increase. But suppose the profits of the farmers were greatly increased by that means. We have only a little over 1 per cent of our land in apples—between 1 and 2 per cent—and, you see, we can plant fifty times as many acres as we have now and thus easily undo anything accomplished by organization, because it would simply create a wider area of overproduction. In other words, taking the average of a long series of years, without any relation to the market at all, there is a permanent overproduction of apples, unavoidably. Temporarily there may be underproduction, but taking the average of a long series of years there is a permanent and unavoidable overproduction of apples.

Mr. REILLY. What is the remedy for that proposition?

Mr. SPILLMAN. To grow fewer apples.

Mr. REILLY. But how are you going to do it? They will get in the way of the antitrust law?

Mr. SPILLMAN. Possibly, yes. I have a remedy for that, but I can not give it in a minute. We have a remedy; but I want to illustrate with one more crop. Take the Irish potato crop.

Mr HELGESEN. You started out with apples, and if you have finished [illegible] subject I think it would be well to give the remedy.

Mr. SPILLMAN. The remedy applies to everything; not to the apple

Mr. RUBEY. Before you leave the apple-crop condition, I want to make an observation as to the apples grown in the Ozark region of Missouri. We call our country down there the land of the big red apple. Twenty-five years ago everybody that could get a little piece of ground to put in an apple orchard did so. That was done far and wide all through the country. They put out apple trees, everybody put out apple trees, and the result is now that there is not 1 in 10 who makes anything out of their apples.

Mr. SPILLMAN. Yes. Now, let us take the potato crop. Irish potatoes occupy 1.2 per cent of the crop land in this country. You see it is easily possible to plant more Irish potatoes than there is room for them in the market. In one year there is a short crop of potatoes, for some reason, and the price is high, and that high price stimulates planting. The next year the farmers in the big potato-growing regions usually get 8 or 10 cents a bushel for their potatoes. Frequently they can not get that. Any of you gentlemen from Michigan know that is true. Now, that low price will cause underplanting the following year, and there will be a short crop and a high price that year. And the price of potatoes goes up and down, away below one year because of overproduction and away above another year because of underproduction. Now, suppose by organization we get a method which will eliminate all of the cost of distributing the crop and get it so the consumer can buy direct from the farmer and not even have to pay any freight on it, what effect would that have? By getting the potatoes so much more cheaply than they can get them now the people would eat more potatoes than they do, and the price would rise, and the farmer would grow a double crop the next year, and his potatoes would not be worth 2 cents a bushel.

Mr. HELGESEN. And yet you have taken the duty off of potatoes and let them in from Europe?

Mr. SPILLMAN. Yes; but that is a matter that does not concern me at all.

Mr. OVERMYER. I suppose they are eating all the potatoes they have in Europe now.

Mr. SPILLMAN. They are pretty nearly doing that.

The point I am making, gentlemen, is this: That to go out and teach the farmer how to grow 200 bushels of potatoes to the acre instead of 100 bushels does not solve the problem; to go out and teach him how to grow 50 bushels of corn to the acre where he is now growing 30 does not solve the problem. But that is the kind of teaching that most of us have been doing in the past, and I am as guilty as anybody. I have talked eloquently—as eloquently as I could—to get the farmer to grow more corn to the acre and to try to teach him how to grow two blades of grass where one grew before. But that does not solve the farmer's problem, gentlemen.

There are so many important things to say that I do not know where to begin. But there is a solution, and I will take it up right here. We make farm-management surveys. We will take a community of about four to six hundred farms and make a business analysis of every one of these farms, and from the study of our analyses of those farms we get some very important information. And here is an illustration now—a very minute fraction of an illustration—of how we will meet that problem I speak of.

[illegible] 378 farmers up in Chester County, Pa., who are growing [illegible] go and ask one of those farmers, "What proportion of [illegible] should you have in corn?" He will say, "I don't know." [illegible] the answer to that question. There were 138 of those [illegible] who had less than 20 per cent of their land in corn. There [illegible] of them who had from 20 to 29 per cent of their land in [illegible] were 42 who had from 30 to 39 per cent of their land in [illegible] 10 of them had more than 40 per cent of their land in corn. [illegible] is a wide difference of opinion among these farmers. [illegible] all of them follow the same kind of farming; they are [illegible] farmers. Which of them was right? Here is the answer to [illegible] I have worked out the average profit made by each [illegible] groups of men, not on corn, but on the whole farm, to find out [illegible] effect the percentage of corn area has on the net profits. In the first group their profits were 94 per cent of the average of the community. In the second group, of 20 to 29 per cent corn acreage, their profits were 2 per cent above the average. In the next group, where there were only 42 out of 378 farmers, their profits were 21 per cent above the average. In the next group, with over 40 per cent corn acreage, their profits were 48 per cent below the average.

Now, those farmers who had from 30 to 39 per cent acreage in corn made by far the greatest profits of those farmers in that region, and yet out of 378 farmers in this survey only 42 of them were in that group, and that, to some extent, by accident. After we found out how much corn they ought to be growing for their own best interests we went around among those farmers and picked out the fellows who were making money and talked to them about this corn percentage, and this is the way they talked to us: "The farmers around here do not grow enough corn. It was all right to grow corn once in a rotation many years ago when corn was selling for 50 cents a bushel, but to-day it is selling for 80 cents a bushel, and these fellows do not grow enough corn, they ought to grow it for two years in their rotation." There were 42 in that group, and some of those 42, say 30 of the 42, had reasoned the thing out—less than 10 per cent of the whole number in this survey. Now we can go up into that county and say to those farmers, "You put in corn two years in your rotation. These fellows who are doing that are making far more money than you are." That is corn.

How about wheat, hay, and oats? Here is a very important and interesting story about oats: Remember, now, that this is in Chester County, Pa., 38 miles from Philadelphia, the survey area coming down to the south line of the State, taking in the little corner between Maryland and Delaware. The survey is right at that corner and includes a little strip that runs down between the two States, Maryland and Delaware. There were 140 of those farmers that grew no [illegible] all and 141 who had less than 10 per cent of oat acreage. [illegible] in who had more than 10 per cent of their land in [illegible] the profits they made, expressed in percentage of the [illegible] who grew no oats at all made a profit of 17 per [illegible] those who had just a little oats 2 per cent [illegible] more than 10 per cent of oats 27 per cent [illegible] The answer, then, to how much oats you should [illegible] not notable here. Yet when corn was

Here are 378 farmers up in Chester County, Pa., who are growing corn. You go and ask one of those farmers, "What proportion of your farm should you have in corn?" He will say, "I don't know." But here is the answer to that question. There were 138 of those farmers who had less than 20 per cent of their land in corn. There were 188 of them who had from 20 to 29 per cent of their land in corn; there were 42 who had from 30 to 39 per cent of their land in corn, and 10 of them had more than 40 per cent of their land in corn. Now there is a wide difference of opinion among these farmers. Practically all of them follow the same kind of farming; they are dairy farmers. Which of them was right? Here is the answer to that question. I have worked out the average profit made by each of those groups of men, not on corn, but on the whole farm, to find out what effect the percentage of corn area has on the net profits. In the first group their profits were 94 per cent of the average of the community. In the second group, of 20 to 29 per cent corn acreage, their profits were 2 per cent above the average. In the next group, where there were only 42 out of 378 farmers, their profits were 21 per cent above the average. In the next group, with over 40 per cent corn acreage, their profits were 48 per cent below the average.

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50 cents a bushel their oats were profitable and should have been grown and were grown, and the reason they are being grown now is because 20 years ago corn was 50 cents a bushel. Now we are ready to tell those farmers in Chester County what proportion of the land to put in corn and what proportion to put in wheat and oats and hay and potatoes. We are ready to tell them that there is only one other crop that it is worth while for those dairy farmers to grow, and we are ready to tell them just how much of that they ought to grow.

It is by balancing production to the needs of the community and of the Nation that we are going to increase the welfare of the farmers of this country. That is so important that I want to repeat it. It is by balancing the production to the needs of the community and the Nation that we are going to raise this $402 that the average farm family gets for its labor for a year. Why will that raise this $402? The answer to that is simple and easy. I will draw my first illustration from the cotton fields of the South.

Take a district which your honorable chairman here represents. The average farm in one of the important counties down there is 76 acres. Of that, 34 acres are in cultivation. About 50 per cent of that is in cotton. Most of the rest of it is in corn. Now, there is a period along in the spring when cotton is just about 5 or 6 inches high where every man, woman, and child connected with that farm must get out in the field with a hoe or down on their hands and knees to pull weeds and thin cotton. During the rest of the season, until cotton-picking time, there is not enough work there for a 600-pound mule; but when cotton-picking time comes they need about 7 or 8 people on that 34 acres to pick cotton. Cotton is a crop which calls for a tremendous amount of labor during one little short period of the year, and they must have enough labor to do that. The rest of the time they are idle, or poorly occupied, because one man—one full-grown man—following a 600-pound mule with a little Georgia stock, with a scooter attached to it, is not earning very much. He is earning about 10 cents a day, and he gets about 10 cents a day for his labor; but when he is picking cotton he is earning $1.50 a day, and he gets $1.50 a day for it.

The trouble is this: The farms of America average too small. However, that does not apply everywhere. In some places the average is larger than it ought to be; but, taking the country as a whole, the farms are too small to enable the average farmer to earn a decent laboring wage. Because of the one-sided cropping system, because of the one-sided system of agriculture, his work is so arranged that he has most of it to do in two months, and the rest of the year he is poorly occupied or not occupied at all; and he does not have an opportunity to exercise his full earning capacity.

And we propose, by balancing production to the needs of the community and by diversifying his system of farming, with a view to giving him full employment for 12 months in the year—or 10 months—we will leave two months for holidays and fishing—and let him earn a man's wages. Now, that is what the Office of Farm Management is trying to do, and we are trying to find out how to balance this agriculture. We found out in Chester County, Pa., and we have now about a dozen more surveys of that kind completed, which are now being rapidly whipped into shape for publication, so that we can

... those communities where we make these ... under a reasonable number of those surveys ... what we have already done. I can see clearly, ... direction over wide areas is narrowing down between where ...

... generalizations can be made from a small amount ... on an illustration. When we found that these ... per cent or 4 per cent and 5 per cent ... asked ourselves the question: Should those ... corn and hay or feed ... and live stock ... hypothetical and ... stock when they do ... can not get out ... and live stock they ... farms to-day should they feed that hay or sell it? ... they got $22 a ton for their hay. Most people would ... when you have a cow which will produce $80 worth of ... and hay is selling for $22 ... that you are throwing ... to feed it. I would have said that myself. But when I looked at those figures and took those who were selling no hay at all, those who were selling a little hay, those who were selling more hay, and those who were selling much hay, what did I find? I found that those fellows who were selling no hay at all were making very small profits; those fellows who were selling a whole lot of hay were making extremely low profits; and those fellows who were selling the least bit of hay, but still selling hay, were making by far the biggest profits of all. Why? Not because they had the hay to sell, but because they had a little more hay than they needed to feed liberally. If they have just a little less hay than that, they starve their cattle, and their cattle do not produce the goods. The question, then, is how much hay should you sell, or how much hay shall you grow, and the answer is to grow just a little more than you need in order to be sure to have enough to feed. That is the answer.

Now, I go out in Lenawee County, Mich., where hay is $12 a ton, and I ask the question: "How much hay should you men grow?" And I find that instead of 14 per cent, as it is in Chester County, it is 35 per cent. Should you grow any for sale? The answer is absolutely and identically the same as it was in Chester County, Pa.: Grow just a little more hay than you need and have a little to sell—not in order to be able to sell hay, but in order to be able to feed your cattle all they want.

But how about corn? Shall the Chester County farmer when he is getting 81 cents for corn feed his corn or sell it? The answer is, grow just a little more corn than you need for feed—not in order to be able to sell corn, but in order to have a little more corn than your stock can eat, so that you wont starve them.

I will go back [illegible] to Lenawee County, Mich., where corn is 60 cents [illegible] Absolutely the same answer applies to it: Grow just a little [illegible] you need in order that you may be sure to feed your [illegible] but feed it

[illegible] that it is not necessary to survey every farm [illegible] to find out what the balanced agriculture is in [illegible] of the country.

[illegible] I would like to respect the rule, but [illegible] to me if you are going to respect it this [illegible] you say that the farmers in Chester

County must feed their hay not to the hypothetical kind of stock that they do not have but what they do have?

Mr. SPILLMAN. Yes.

Mr. HELGESEN. Do you find the statement you have made applies with equal force to any kind of cattle, whether good, bad, or indifferent?

Mr. SPILLMAN. No.

Mr. HELGESEN. I do not mean that the results would be the same, but would the advice be the same—to feed the poor stock, if you have it?

Mr. SPILLMAN. No. I am speaking now of the average farmer. I am glad you asked the question, because it causes me to think of a point which I have not made clear. What I have said here applies to the average cow—the $80 cow, the cow that will produce $80 worth of milk a year. I will elaborate that a little. I will say it applies also to the cow which produces $70 worth of milk a year; and we will come on down to about $65 a year, possibly to $60, but there is the limit. Below that I give them different advice. If the farmers' cows are so poor that they bring him less than $60 a year, I will say: "You will make more money if you will kill those cows and bury them; then you will have a little profit; they are eating up your profits now. Then you would grow your hay and sell it." But what I would advise that farmer to do now would be to sell, because he would have the meat from those cows.

Mr. HAUGEN. Do you mean $60 in cream?

Mr. SPILLMAN. Milk or cream—dairy products. I will say to that man, "If your cow is of no account on your place, that is, produces less than $60 worth of dairy products per year, you should dispose of her at once; because her empty stall will make more money than she does."

Mr. HAWLEY. I would like to ask one question. Do these statements you make have general application over a long period of years? The reason I ask the question is that if the farmers take this advice of feeding their crops to the cattle for milk and meat production, that might be true at this particular period of our history, where those products would be selling for a good price——

Mr. SPILLMAN. Yes.

Mr. HAWLEY. But might it not result in an overproduction of meat and milk, so that the advice would no longer be applicable?

Mr. SPILLMAN. When economic conditions change, then the advice we give has to change too. I can illustrate that, possibly, with these figures right here. Twenty-five years ago the price of corn in Chester County was from 50 to 60 cents a bushel and at that time the farmers developed the habit of growing corn once in a rotation, having 18 or 20 per cent of their land in corn. The farmer was right under those conditions. But in 1896 the price of corn suddenly went up to 80 cents a bushel, and it has remained there practically constantly ever since, and that called for a readjustment of agriculture. During that period oats were relatively profitable there, but when corn increased in price it meant that corn should increase in acreage and that oats, being a less profitable crop, must give way. And we find that the change which that advance in the price of corn necessitated called for nearly double the area of corn in that region: But in the 20 years since then there has been an increase of about 25 per cent in corn

acreage one-fourth in one acreage. In other words, to leave the land to the farmer himself, it would take him 80 years to get back to acreage just where it belongs. To raise it from 18 per cent back to 25 per cent would take 20 years.

While we are on this survey work I will make a general statement which I think is worth while to the committee. There are 6,000,000 farms in America. We believe if we are allowed to make 1,000 of those surveys every year, instead of one, that we can cover the country in 6 years with 6,000 surveys, and then at the end of that time start in again and in every 5 years to make 60 of those surveys, scattered widely over this country. That is an average of one survey to 100,000 farms once in five years. We believe in that way that we can indefinitely keep the agriculture of America on an even balance. After we have covered this country with surveys like that and there is then a change in the economic conditions, such as occurred recently, we can practically at once point out the changes that should occur in the agriculture of the country. We believe we can do that.

It will cost an average of about 10 cents per farm per year for the farmers of the United States to get that information.

Mr. RAINEY. How many surveys have you already conducted?

Mr. SPILLMAN. We have perhaps 30. I have a map right here showing every survey we have ever conducted. Some of them are really not surveys. This is the map exhibiting. Every dot on that map represents a survey, a business survey. Many of those dots represent a survey of only 75 farms. That is not enough to enable us to balance the agriculture of the community. Perhaps a dozen of those represent as much as 400 farms, and in a few instances 600 or 700 farms. We need 600 farms in order to balance the agriculture of a region with any degree of confidence.

Mr. RAINEY. All surveys are limited to a county, are they?

Mr. SPILLMAN. Most of them a county. We take a community of 600 farms and do not skip anybody, taking the good, the bad, and the indifferent in every one to get selected farms, because we want to get the average of that community.

Mr. RAINEY. Do you not find some difficulty in balancing the farmers?

Mr. SPILLMAN. Oh, yes; lots of difficulties.

Mr. RAINEY. You find some farmers who can take more oats and make a profit out of it and others who should take less oats and less corn?

Mr. SPILLMAN. Oh, yes; depending on the type of farms, their value, and the farmer's predilections. We are not going to make a mechanical job where every man will take the same kind and size of dose. For instance, in Chester County, Pa., I am talking about one type of farmer, and that is the dairy farmer solely.

Mr. RAINEY. Have those surveys been made in various parts of the country?

Mr. SPILLMAN. Yes; those dots on the map show where they have been made.

Mr. HAUGEN. I would like to ask this question: Your estimates are based on an experience of one year in Chester County, or for how long?

Mr. SPILLMAN. We have made a careful study of the region and of its history back to 1840.

Mr. HAUGEN. For how many years have you kept books for them?

Mr. SPILLMAN. One.

Mr. HAUGEN. One?

Mr. SPILLMAN. Yes; but we made a careful study in respect to these [illegible]; we determined just how far from normal production was that year, and we studied the yields of corn for 10 years past in that region and compared that with the average of this year, and in that way found out whether it was normal or not.

Mr. HAUGEN. But you kept books only for one year?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. The books tell the story?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. That is how you arrived at your conclusions?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. And you now find you are ready to go out and tell those people what to do?

Mr. SPILLMAN. Tell those dairy farmers what to do; yes.

Mr. HAUGEN. And you can now tell him that he must grow a certain percentage of corn—40 per cent or whatever it is?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. And then they can make a certain profit?

Mr. SPILLMAN. No; that does not follow at all.

Mr. HAUGEN. Based on your experience, you ascertain the facts——

Mr. SPILLMAN. I will put it this way. If they will grow two years of corn in a rotation, they will find it easier to make the farm profitable.

Mr. HAUGEN. You do not recommend two years unless it is necessary for him to make room for more corn?

Mr. SPILLMAN. On the dairy farm, certainly.

Mr. HAUGEN. In order to plant a certain percentage of corn, you have to grow corn two years in succession?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. And then you are ready to suggest to the farmer that he must grow corn to a certain extent?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. And to cut out oats, because he will lose a certain percentage by growing oats?

Mr. SPILLMAN. No; I would not say that; but oats are less profitable than corn in Chester County.

Mr. HAUGEN. What are you going to tell them?

Mr. SPILLMAN. We are going to tell them this—and that is what we already have told them—that oats is the least profitable crop of this community and that they can put in any other crop they have instead of oats and thereby make it easier to make your farm profitable.

Mr. HAUGEN. So far as your experience goes, growing oats means an absolute loss of 27 per cent, does it not?

Mr. SPILLMAN. No, sir.

Mr. HAUGEN. That is the figure you gave—27 per cent?

Mr. SPILLMAN. No. I put it in this way: That the farmer who had no oats at all made a profit of 17 per cent above the average; the farmer who had between 1 and 9 per cent of land in oats made a profit of 2 per cent above the average; and those who had more

than 10 per cent of their land in oats made a profit—not a loss—of 27 per cent less than the average.

Mr. HAUGEN. Then, what is the average profit, and we can get the percentage?

Mr. SPILLMAN. The average is a hundred.

Mr. HAUGEN. Do you mean to say they can make a profit over there of 100 per cent?

Mr. SPILLMAN. Not an average profit of 100 per cent. The average profit was 7.8 per cent on the investment.

Mr. HAUGEN. Then you mean 27 per cent below, or 27 per cent of 7.8?

Mr. SPILLMAN. The average profit is 7.8 per cent. Now, these fellows who had a good deal of oats made one-fourth less than that, say 5 per cent profit, and those who had no oats at all made 10 or 11 per cent profit.

Mr. HAUGEN. Now, I will show you where your figures might be absolutely misleading.

Mr. SPILLMAN. I would be very glad to know it if they are.

Mr. HAUGEN. If you had gone into Iowa in 1914 and suggested to the farmers to grow corn, your suggestion would have been very valuable to the farmers, because they would, many of them, have grown 70 or 80 bushels to the acre. They were getting as high as 70 cents a bushel for their corn. At 80 bushels they would get $56 per acre, and for 70 bushels they would get $48. If they had grown oats they would have grown, probably, 50 to 60 bushels. Fifty bushels to the acre, at 42 cents a bushel, would have been $21, and for 60 bushels $25.20. Hence if books had been kept for that year, you would have told them, "next year plant corn; gentlemen, that is the thing to do; that is where you get your profit." And what would happen? Last year, 1915, that would have had about 50 or 60 bushels of oats per acre. Fifty bushels, at 42 cents, would be $21, and 60 bushels would be $25.20. For corn, about one ton to the acre, selling at about $8 per ton; yes, hundreds of acres selling at $1 to $2 per acre. Of what value would that advice have been?

Mr. SPILLMAN. Mr. Haugen, have I ever given any advice to the farmers in Iowa about that?

Mr. HAUGEN. If that is not the advice to farmers, what is it?

Mr. SPILLMAN. Have I given any advice to the farmers of Iowa on the subject?

Mr. HAUGEN. If not advice, what do you do?

Mr. SPILLMAN. I have not advised the farmers of Iowa to grow corn any more——

Mr. HAUGEN. If that information is not of some value; if it is not to be accepted by the farmer as advice of the department, of what value is it?

Mr. SPILLMAN. It would be of no value whatever.

Mr. HAUGEN. Then it is of no value whatever to any section of the country?

Mr. SPILLMAN. I have not given any advice to the Iowa farmers yet, Mr. Haugen.

Mr. HAUGEN. What is it?

Mr. SPILLMAN. When I do give advice to the Iowa farmers, then it will be safe for the Iowa farmers to follow it.

Mr. HAUGEN. And we can follow that?

Mr. SPILLMAN. When I do give advice, yes.

Mr. HAUGEN. But you have stated here positively that it is unprofitable to sell hay.

Mr. SPILLMAN. Yes; in Chester County, Pa.

Mr. HAUGEN. Let us take up that proposition.

Mr. SPILLMAN. Yes.

Mr. HAUGEN. Corn say, $10 a ton, and hay selling for $20 a ton.

Mr. SPILLMAN. Yes.

Mr. HAUGEN. Would you suggest, then, feeding hay instead of corn, when corn can be fed for half the price that hay can be fed for?

Mr. SPILLMAN. Not under those conditions.

Mr. HAUGEN. As a general thing, you say don't sell hay; one year I shipped my hay to Mississippi and got net $20 a ton, and bought corn at $8 a ton. I believe that I made money by so doing.

Mr. SPILLMAN. Yes; and when I give advice to the Iowa farmers, if I do give them any advice of that kind, I will know what I am talking about. I do know in Chester County what I am talking about. But in Iowa I have not given any advice to the farmers at all.

Mr. RUBEY. I think it can be settled in this way, that the advice you give is given to those farmers where you make this study and this investigation, but not to all farmers throughout the country.

Mr. SPILLMAN. Certainly.

Mr. RUBEY. And the advice given to one place does not apply to some other place?

Mr. SPILLNAM. Does not apply to another place; no.

Mr. HAUGEN. You said a moment ago that you never give advice.

Mr. SPILLMAN. Mr. Haugen, you misunderstood me. I do give advice. The point is this, Mr. Haugen, if I may be permitted to proceed, that when I have the necessary facts on which to reach conclusions I give advice, but I do not give advice before that.

Mr. HAUGEN. Yes, and you have reached conclusions in this investigation?

Mr. SPILLMAN. In Chester County, Pa., yes.

Mr. HAUGEN. Suppose next year it should turn out exactly as it did in Iowa. This year they had a good corn crop and a poor oats crop. Now, then, you have reached a conclusion and you give advice to those people. Suppose next year they had a poor corn crop over there and a good oats crop, of what value would your advice be?

Mr. SPILLMAN. We did not give this advice without first learning how often such crop reverses occur. They are rare in eastern Pennsylvania—so rare as to have no effect on farm practice there.

Mr. HAUGEN. I take it that you would give the same advice to the farmers that you have indicated here to the committee?

Mr. SPILLMAN. I would.

Mr. HAUGEN. And the advice in your talk here before the committee is advice to the farmer, because the record of this hearing goes to the farmer; this is a public document.

Mr. SPILLMAN. Yes, sir. But when I give advice to the Iowa farmers, I will give it as openly as I gave it to the Chester County farmers, and when I do give that advice it will be sound advice.

Mr. HAUGEN. Will your advice be, now, to plant corn?

Mr. SPILLMAN. I do not know. I am not able to tell what I am going to advise before I know what the facts are.

Mr. HAUGEN. But you say to plant corn for two years in a rotation on 40 per cent of the acreage when corn is worth 80 cents a bushel?

Mr. SPILLMAN. In Chester County, Pa.

Mr. HAUGEN. Wheat used to sell for 18 or 20 cents a bushel and now it sells for $1.30.

Mr. SPILLMAN. Yes.

Mr. HAUGEN. Have you taken that into consideration?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. You do not contend that you will be able to control the market?

Mr. SPILLMAN. No, sir.

Mr. HAUGEN. And price is a matter to be taken into consideration?

Mr. SPILLMAN. I do pretend to say this to those Chester County farmers, where we made the study, that, if wheat goes up above, say, $1.20 a bushel, then it will be a good plan to put in wheat two years in your rotation.

Mr. HAUGEN. I hope we do not have to employ experts for that information. There are certain things to be taken into consideration before giving advice just what to do, but it is not necessary to tell them that they must take into consideration the price of grain.

Mr. SPILLMAN. Certainly.

Mr. HAUGEN. I take it, it is not necessary to send a man from Washington to tell them that growing wheat is more profitable at $1.20 than it was when worth 60 cents a bushel.

You spoke about the dairy farmers and said you took into consideration milk and cream. Is it not a fact that in many localities little consideration is given to the milk and cream; that the cow is kept for beef?

Mr. SPILLMAN. I do not see what that has to do with the present discussion. We are talking about dairying in Chester County, Pa.

Mr. HAUGEN. If you have been in a dairying district, you will understand that they take into consideration beef as much as dairying. Some veal their calves and others do not. Some buy a beef strain; others, milk strain; thus to cut it in two and to produce beef along with cream.

Mr. SPILLMAN. Yes; and we are getting some very important facts in connection with it, too.

Mr. HAUGEN. You take that into consideration?

Mr. SPILLMAN. Yes; we take all these things into consideration. If you will read this bulletin here you will find that we do take such things into consideration.

Mr. HAUGEN. My understanding was that it was not taken in to consideration this morning.

Mr. SPILLMAN. I was talking about a strictly dairying region in Pennsylvania.

Mr. STEELE. As I understand from your talk, the object of this department is to balance the farms. In other words, suppose you had gone out and planted corn and sold it for a large price and made [illegible] profit. Then they should not go into the planting of more [illegible]t year. But the object is to balance this farming so that [illegible] make a profit this year, next year, and in the years to

Mr. SPILLMAN. Yes.

Mr. STEELE. I am free to say that this is the most interesting discussion on the management of farms and what is necessary for the farmer that I have heard since I have been on this committee, and I would like to have him proceed.

Mr. SPILLMAN. When we are ready to make recommendations to the farmers we take into consideration the chance of a loss of crop, the chance that there will be an abnormally good crop—those things have to be taken into consideration before we can give any advice to the farmers. We must know the facts for the region, and we must have a study of those facts.

In Chester County, Pa., we worked out the approximate cost of keeping a dairy cow. Giving the cow proper credit for manure and all, the net cost is about $95 a year. If a farmer, then, has a cow that will bring in $70 a year, he is losing $25 a year on that cow. Most authorities would say that that farmer ought to go out of the dairy business. I thought that myself before I began this study. But now I know that that farmer, although he is, according to all standards of cost accounting, losing $25 a year, is actually making a profit out of his cows—that is, the more cows he has to lose $25 a year on the more profit he will have at the end of the year. And I know why he will have that profit as a result of these studies. Not only that, but speaking now in a very general way and recognizing many exceptions, the average farmer of the country pays his running expenses from these things on which he actually makes a profit. He makes his profit on those things from which he is losing money. And I can prove that. It will take me some time to prove it to this committee, but it will come out in these bulletins. In the next bulletin I write that will be positively proven. It is partly proven here [exhibiting bulletin]. I had not discovered the whole facts when I wrote this bulletin, but I have discovered the facts now, and I understand the reason why.

One reason why the cotton grower of the South has such a small annual income is that he just has those things that he at least breaks even on, and he does not have a lot of those other things which, according to cost-accounting standards, he would be losing money on. He has not enough things to lose money on, and therefore he makes no profit at the end of the year.

I will illustrate that with poultry, and that, by the way, is given in this bulletin. We find in Chester County, Pa., that the farmers who have no poultry at all make extremely little profit; they do make some, but very little. As the number of poultry on the farm increases, the profits of the farm run up in a most remarkable manner until we get to about 150 hens. And at that point, while this profit is running up, these poultry are not earning the cost of their keep, according to all cost accounting standards. They are not paying the farmer 15 cents an hour for the time that he puts on them. They are not paying him $1 a bushel for the wheat that they eat. And yet, as this losing proposition increases in magnitude, it increases the profit of his farm until we reach about 150 hens. But when it increases beyond that the profits of his farm fall off in an increasing ratio up to about 200 to 300 hens. The farmers who have 200 to 300 hens are making extremely little money. But when they get up to 500 and 600 hens that curve turns up a little, because you begin to

introduce the skill of the real poultryman, and from there on up there is a possibility of profit again.

Why does this losing proposition add to the profits of the farmers? It is perfectly simple. In all kinds of cost accounting we assume that the farmer is entitled to pay for the time he puts on an enterprise at the current rate of wages, and that is a fair proposition, I think. Up to about 150 hens the time that is devoted to those chickens is time that would be utterly thrown away if the chickens were not there. If the farmer got 20 cents an hour for that time, we would say that he is making a profit of 5 cents an hour over and above his labor. If he got 15 cents an hour for his time, we would say he is just breaking even; he is just getting back his expenses. If he gets 10 cents an hour, we would say that he is losing 5 cents an hour. But the fact is, gentlemen, that he is making a profit of 10 cents an hour if he gets 10 cents an hour for that time, because if he did not have those chickens he would not get that 10 cents.

Mr. LESHER. And is it not a case of the chickens picking up a whole lot of stuff that would otherwise go to waste, but if he has 150 chickens he saves that waste?

Mr. SPILLMAN. Yes; that is another reason, anyhow. One reason is the time devoted to them is waste time. Another reason is that the feed they eat is largely waste feed up to that point. Another reason is that up to that point the quarters are constructed from boards off the fence, or boards from the barn when it was remodeled, or from a pile of lumber which has been lying around for years. Up to that point they are scavengers on the farm. The 10 cents an hour for the time the farm family gives to them is 10 cents profit. If there is available to the farmer an enterprise that will pay $10 a day, the farmer ought to get all of that he can manage. Suppose it is hay, which frequently does pay $10 a day, but he only gets 10 or 20 days' work from it. That is not enough work to make a good living, even at such wages. In the South it will be cotton. When the cotton grower gets all of this $25-an-acre enterprise he can manage; the trouble is he stops there. He should go on and put in other less profitable enterprises that do not interfere with his major enterprise. After he has put in all of, say, some $1.50 enterprise that he can get in, there are still gaps and holes and idle places in his work schedule. Now, put in the most available enterprise that will pay, say, a dollar a day for a few days' work, and you get all the dollar-a-day enterprises you can. Then put in a half-dollar a day enterprise, and then a 25-cent enterprise. If he has a few other little places where he can get a little idle time, then stick in a 10-cent enterprise and add 10 cents to the profits at the end of the year. Now, by all standards of cost accounting that 10-cent enterprise is losing him $1.40 a day, because it lacks that much of paying him current wages; but it pays him 10 cents a day for time for which he would not otherwise get anything, and hence that 10 cents is profit at the end of the year and shows as a profit on his books.

Mr. REILLY. In other words, diversify his industries so as to take up all of his time?

Mr. SPILLMAN. Yes; diversify his industries so as to give himself an opportunity to earn money every day, to keep his horses at work, and to keep his plows and harrows at work. If a farmer distributes throughout the year, two horses then would be able to do

what it might require six to do in one month. The idea is to distribute the work throughout the year so as to give employment at something that will bring in a sum of money over and above actual outgo.

Mr. REILLY. To keep 150 chickens on the ordinary farm would only cost the grain to feed them?

Mr. SPILLMAN. That is practically all.

Mr. STEELE. Just what they would pick up as scavengers, as you say?

Mr. SPILLMAN. They would only pick up the grain, as I say, that could not be sold. Then there is other stuff the chickens pick up, such as grasshoppers, worms, and weed seeds. They scratch in the barnyard and around the grain stacks, and the feed thus obtained costs nothing.

Mr. REILLY. And your theory that a man can profit by keeping a cow which returns $70 a year, when it costs $95 to keep her, is based on two ideas. One is the actual productiveness and the other is that it occupies time that will largely go to waste?

Mr. SPILLMAN. Yes. And then there is another fact. You have cornstalks and other coarse feeds to mix with the grain, and in Chester County they are fed to the cows. Much feed of this character goes to waste in the Middle West, but not in Pennsylvania.

Mr. HAUGEN. In Iowa the hogs get it and eat it.

Mr. SPILLMAN. They are often burned, but in Chester County all the cornstalks are fed either as silage or as fodder. These cornstalks at the present time are worth several dollars an acre, because that is what the farmer gets out of them. If the cows were not there, they would be worth, at the outside, 50 cents an acre as steer pasture. So with this $70 cow, if she eats $8 worth of cornstalks, that is an $8 profit and not an $8 loss.

We have only just touched upon one phase of the work of the Office of Farm Management. We have other lines of work just as important, but I hardly think it is necessary to go over everything in detail. There are a few things, of very great importance, however, which I would like to touch upon.

Mr. HAUGEN. What do you mean by burning cornstalks in Iowa? You do not mean that they set them on fire?

Mr. SPILLMAN. A great many people do.

Mr. HAUGEN. Burn the cornstalks in Iowa?

Mr. SPILLMAN. Yes.

Mr. HAUGEN. You mean in the spring in preparing the soil for crops.

Mr. SPILLMAN. Yes. I do not mean that they make firewood of them.

Mr. STEELE. They do not burn them on the Steele farm. They do on other farms.

Mr. HAUGEN. There was a time when corn was burned as fuel.

Mr. SPILLMAN. Oh, yes; I have seen that done myself.

The CHAIRMAN. You made a statement some time ago that was rather interesting to me, and that is that the farms in this country are too small——

Mr. SPILLMAN. That is, the average farm.

The CHAIRMAN. The average farm—to be most highly profitable.

Mr. SPILLMAN. Yes.

The CHAIRMAN. I was trying to reconcile this statement in my mind with the system of agriculture in certain other countries—especially Germany—where the acres are very small.

Mr. SPILLMAN. I am glad you mentioned that. I will say this, that you can divide the farming area of the world into three general groups, of course, with a more or less indefinite line between them. One is what they call the extensive farming area, and the other is what they call the intensive farming area. The general farm is the ordinary small farm, in which the people live on the most intensive kind of farming. The point I should like to emphasize is that this intensive farming is made possible by the presence of a very large number of great cities within the reach of their markets. We have in America a few cities of that kind, but not to the extent that they have in Europe. For instance, Europe is devoted to vegetables other than potatoes and we produce only [illegible] tenths of 1 per cent—a great deal—but we do produce it, and every year there are vast quantities of those vegetables that rot because there is more produced than can be consumed. We are doing all the intensive farming that there is any need for in this country.

The CHAIRMAN. In other words, I take it that while the average size of the farm, as I recollect, is about [illegible]

Mr. SPILLMAN. Yes.

The CHAIRMAN. That that kind of farming is raising vegetables, fruit, and crops of that nature?

Mr. SPILLMAN. Yes; and poultry.

The CHAIRMAN. And you are speaking of state of fact?

Mr. SPILLMAN. The point is this: That in America there is no more room for that kind of farming.

The CHAIRMAN. There is a limited consumptive [illegible]

Mr. SPILLMAN. Yes.

Mr. HAWLEY. And there are 67,000,000 people in Germany in an area less than the size of the State of Texas.

Mr. SPILLMAN. Yes. There is room for a large proportion of Germany to be in vegetables and fruits and it is devoted to the most intensive kind of farming, whereas in this country we produce as plentiful a supply of these crops as Germany does but it takes only eight-tenths of 1 per cent of our crop area to do it. You see the American farmer is compelled, in the main, to practice extensive farming.

Mr. HASKINS. In speaking of the average farms in this country being too small can you give an understandable statement of the size of the farm without discussing some particular industry on the farm?

Mr. SPILLMAN. No; you can not.

Mr. HASKINS. Do you think, then, that the statement that the average farm is too small applies to all kinds of farm industries?

Mr. SPILLMAN. No. I said that the average farm in America is too small. There are certain classes of farms that are larger than I would [illegible]

Mr. HASKINS. Are there not also certain classes of industries that will require much less land?

Mr. SPILLMAN. Yes. Take truck growing, for instance, which requires perhaps the smallest area of anything, except the greenhouse

business. Truck growing is perhaps one of the most intensive types of farming which we have in this country. And when we take the truck-crop farms in America, the average size of those truck-crop farms is very much too small. The average truck grower in the United States is not making a decent living to-day.

Mr. HELGESEN. It is not understandable, or it is not of any particular benefit to anybody to tell us that the average size of the farm is too small. But if you can divide up the farms into the various types of farms and into farm units and tell the American people, "if you are going into this, into a one-man business—if you are going to do the work yourself—get so many acres; if you are going to have two units, or two men, twice that much," and so on, then you are rendering a service.

Mr. SPILLMAN. That is right, discussed in this bulletin [indicating pamphlet]; every bit of that is right in this bulletin, for that one community. That is exactly what we are trying to do. I may say that the ultimate object of the work here is to be able to do exactly what you have suggested. We will say in this region "if you want to run a poultry farm, then do not expect to go on less than so many acres. If you want to run a one-man dairy farm, why this is the size it should be. If you want to run a two-man dairy farm, this is the size it should be." And for this dairy community, that is done in this bulletin, and that is the ultimate object. Let me put it in this general way, that we expect to be able to say ultimately for all parts of the United States, what the minimum size of farm should be for any particular set of conditions. We do not expect to give the maximum size of the farms, because while logically, so far as the economics of the question are concerned, there is no maximum size, yet sociologically there is. But I am speaking of the minimum size of farms. We expect to say this to the farmers in any particular section of the country, when we have been able to cover the country with our work: "If you want to run a one-man farm, of a given type, you should not make it smaller than so many acres."

We have already been able to do that for a number of cases. Let us take the case of the sugar-beet growers out in Utah, for instance. The Reclamation Service asked us to make an economic study of one of their reclamation projects and we found that for the average farm family in that region 40 acres would be the minimum size, but that a farm of that size is profitable only because of the sugar beet. If anything happens to the sugar-beet industry we would recommend that half of these farms should be sold and the farms combined to make 80-acre farms and then for them to go into a different type of farming, mainly based on dairying with some beef cattle on the side, with grain production. We hope some time to be able to say what size of farms for all types and all sorts of conditions are proper. In Chester County, Pa., for a group of 54 farms of 40 acres or less, the average wage earned by the owner was $240 a year, or about two-thirds of what laborers get in that community. The next group of farmers, from 40 to 60 acres, largely because they had not fully capitalized the economic value of their land, made interest on their investment and an average wage of $550. Since that time they have capitalized the economic value of their land to a large extent (in the last three years), and those same farmers are now making about $450 a year wages, the rest being interest on their investment.

Mr. [illegible]. What would you recommend to those 40-acre farm- [illegible] use as a side line?

Mr. SPILLMAN. I would not say offhand. The Utah survey was made several years ago. That information is now in bulletin form. [illegible] bulletin recommendations are made on that point. We recommend where they are making the sugar beet a family industry, for [illegible] a crop about 5 to 7 acres, which the family can care for and [illegible] depend upon tramp labor.

Mr. FARLEY. Those items that you spoke about a while ago, where a man could put in a few days' employment in a certain line on his farm, you put in a small amount of what the merchants call "side [illegible]."

Mr. SPILLMAN. Yes; they are side lines; they are fillers that occupy time that would otherwise be idle.

The CHAIRMAN. From your general statement, I take it that this [illegible] work will have to cover communities in practically every county [illegible] United States—in every agricultural county.

Mr. SPILLMAN. I would say this, Mr. Chairman, that we believe we can divide the country into sections that will average one survey to 50,000 farms. That will be an average of about 30 counties, and, if we can make one survey every five years on the average for each group of 30 counties in the United States, I believe we can work out these principles, the corners of which we are now in contact with.

The CHAIRMAN. If you undertake to do something like that, it seems to me you will have almost an endless task ahead of you.

Mr. SPILLMAN. We hope we have, Mr. Chairman.

The CHAIRMAN. You have in a way. Some one said here the other day that nothing is ever entirely finished.

Mr. SPILLMAN. That is true.

The CHAIRMAN. Suppose you take up the next line of thought which you wish to bring to the attention of the committee.

Mr. SPILLMAN. Under the project, crop economics, one of the important lines of work, is the study in cooperation with the Bureau of Plant Industry of the economics of sugar beets. Dr. Townsend referred to that in his statement before your committee the other day. His work relates more to methods and details of production, while our work is largely a study of the cost of producing the beets. Prof. Moorhouse, of our office, who is present, worked during the past two seasons on this problem. During those two years he has made a detailed study on several hundred farms—558 in all—of the cost of producing sugar beets. The results are extremely interesting. But the important thing, I imagine, from the standpoint of this committee, is the position of the sugar beet in the agriculture of the region. There have been some tremendous mistakes made by the sugar-beet people, and they have invested millions of dollars where it was absolutely unavoidable that they lose all of it, simply for lack of knowledge of some fundamental principles. There are only a few conditions that we have found under which the sugar beet can be made a permanent enterprise. The sugar beet is a crop that requires at two times in the year an enormous amount of labor—the thinning time and the harvest time. In the general run of the year's work on the fa[illegible] you need a certain force of hands and teams and machines; but [illegible] comes time to thin and weed sugar beets, an army of [illegible] ed if the acreage is large. The difficulty is to get this

labor that is needed for only a few weeks. The tramp is the only capitalist who can afford to work so short a time.

In the fall of the year, at harvest time, much labor is needed again for a few weeks. The only kind of labor that is generally available for that kind of work is tramp labor. The factories have tried to solve the problem by getting people from the beet fields of Europe over here. They are expert in beet work. The factories bring them over here and give them two weeks' work in the spring of the year at wages which seem fabulous to those people, and in the fall of the year they give them two weeks' more work; but they are not able to live on four weeks' wages. The growing of large acreages of beets without other enterprises to balance the labor schedule is dependent upon a supply of transient pauper labor and can not be maintained under any other conditions. There are very few sections where such labor is available.

There are other conditions under which the industry can be maintained that will make it a legitimate, permanent enterprise, and these are the conditions under which it is conducted in Europe. In the first place, and most important of all, a family consisting of a man, his wife, and three children, the middle one old enough to do a little light work, like pulling weeds in the beet patch or picking up beets, can take care of, say, 6 acres of sugar beets, and there are only a few weeks in the year when they are completely occupied with this crop. The rest of the year they can raise a crop of alfalfa, keep a few cows, raise a half acre of garden, a few fruit trees, and so on; in other words, fill in the rest of their time with other things.

When we find a community in which the sugar-beet business is thus organized it is on the firmest kind of a basis and can not easily be uprooted. We find some communities in which the business is on that basis, and there there is no trouble to get the beets for the factory. After the farmers have grown beets 10 or 12 years they get a yield of beets 50 per cent above the average for the country as a whole, and yield per acre is the principal factor that determines the cost of production. Those people produce sugar beets at a cost very much below the average for the country.

The CHAIRMAN. I would like to ask one or two questions. Will you please explain to the committee briefly just what relationship the Office of Farm Management bears to all of the other activities of the Department of Agriculture?

Mr. SPILLMAN. It deals with the practical affairs of the farm rather than with laboratory problems. Our work uses the farm instead of test tubes and balances. We get our results by tabulating the practices on the farm instead of the results of experiments in the laboratory.

Mr. STEELE. In other words, if I came to you, Doctor, and wanted some practical information about the farm, you would be able to give it to me practically?

Mr. SPILLMAN. So far as we had made a study of your region. There are a great many people that come to me and other people in the office, asking for information that we are unable to give them, because we have never studied their region.

Mr. STEELE. You made a statement this morning in regard to alfalfa which I think would be beneficial. As I told the committee the other day, the Department of Agriculture has gotten me to raise

alfalfa and I sowed too much of it. Now I can use this pasture instead and I can save 100 acres of alfalfa and feed a few steers on some part of the year and pasture them on the alfalfa the balance of the year. I can see that the demonstrator is a good one for me, and that instead of waiting for the alfalfa to get ripe and cut it, I can turn my cattle on and feed it and save the great expense of putting it up, and having it in barns and stacks. I have got to have a good piece of land to pasture it on, and then after that the question is how to get it on the land. I can't have a barn large enough to store all the hay that I can raise from the several crops a year on my land and put it in. So I have got to stack it out in the field. And I am sure as a general thing it will be very practical and very helpful to the people who can raise alfalfa.

Mr. [illegible] I think all of your bulletins deal with farm problems in a very [illegible] way. How can a bulletin issued from a station in Arizona [illegible] be applicable to the conditions in Iowa or Nebraska or some [illegible]

Mr. [illegible] Is anybody that I know alfalfa that would be practical.

Mr. [illegible] Our work differs from the rest of the work of the department in another way. Nearly all of the work of the department is [illegible] to get us more to produce more corn; how to get *more pounds of meat out of a hog*; how to do [illegible] on the farm. Now, the Office of Farm Management is [illegible] not with how to do things but with what to do. Shall we grow [illegible] and if so, how much shall we grow? How to avoid the difficulty [illegible] speaks of how of getting more alfalfa than you can handle with the corn you have to grow. You might say we are *working on economic problems* instead of on technical problems—on problems that answer the questions what, how much, and when, rather than how to do things. We ask shall you do it? Here in Chester County, I asked myself the question, shall these farmers keep *beef cattle or dairy cows*, and I got the answer. I found that under *certain conditions*, if a man has a big farm that is well adapted to grass, and he is an old man and can not do much work himself, and with the difficulty with hired help, the best thing for that man to do is to put his whole farm in blue grass to use as steer pasture, and not try to raise anything else. But there is only a small percentage of the farmers there who ought to do that. In general, the answer was—dairy cows, that is the best thing for the ordinary farm in that community.

You see, we are getting at the question of what they should do and how much of it they should do in order to make money.

The CHAIRMAN. And you are getting that information by the surveys which develop what the farmers are doing as a class—what one class is failing to do in the way of making profits and what the other class is doing in the way of making profits—and you get your best information by studying the farms in that community yourself?

Mr. SPILLMAN. That is exactly it.

The CHAIRMAN. Let me ask you this. We had here the other day, I think, in the Office of Markets, a statement very much like one of your statements this morning. Are you conflicting at all or are you dupli[illegible] any work being done in the Office of Markets?

Mr. SPILLMAN. None whatever that I know of. We are not dealing at all with any market problem.

The CHAIRMAN. Doctor, this next little item, No. 109, "for studying methods of clearing off 'logged-off' lands with a view to their utilization for agricultural and dairying purposes," etc.; would you like to make a statement as to that?

Mr. SPILLMAN. We have studied now practically all of the standard methods that are in vogue in different parts of the country for removing stumps and have determined the conditions under which they are applicable, but there are continually cropping out new inventions on that line. Every year we have quite a number of new inventions that are being sold. Frequently they are perfectly worthless or worse than worthless, and sometimes they have some merit, but we test all of those out. Now, the problem has resolved itself in our minds into this kind of a problem: We have learned about what it costs to clear land in different parts of the country, and we have learned approximately the methods that should be used in different parts of the country. Now, the question is, under what conditions is it justifiable to clear land? This past year we made what I think is a very important study of this kind. Here is land with stumps on it that is worth, say, $10 per acre as pasture with the stumps on it. If those stumps were taken off it would be worth a certain sum. We do not know in advance of investigation what its value would be for producing crops or running dairy farms or hog farms or what not. We find in our investigation that it costs, say, $125 an acre to clear a particular class of land. If the difference in the value of the land uncleared and the value of the land cleared is greater than $125, then it will pay to clear the land. If it is less than that, better wait a while until that difference becomes greater, then it will pay. We have been making a determination of the economic value of land with the stumps in it and similar land that has been cleared, in order to see whether present economic conditions justify clearing, and we have some important results which are now pretty well along toward publication.

The CHAIRMAN. Is it your expectation to have this item an indefinite item or do you expect to reach final conclusions in the near future?

Mr. SPILLMAN. On certain phases of the problem I think we have reached final conclusions, or approximately final. They probably will never be absolutely final—that is, as to methods and as to cost of using these different methods we have reached approximately final conclusions. As to the conditions under which any given method is justifiable we have not reached final conclusions yet; but we have made, I think, important progress in that direction this past year, and we can use that fund to very great advantage at least for a year or two more. I can not say now just how much longer, but we certainly can use it this next year to advantage.

The CHAIRMAN. This is not to be regarded as anything like a permanent annual appropriation, is it?

Mr. SPILLMAN. No; it has, I believe, never been regarded as such.

The CHAIRMAN. On page 222 of estimates is an item, No. 8—

to enable the Secretary of Agriculture to print and publish certain maps and charts and reports accompanying the same, heretofore prepared and being prepared by the Department of Agriculture, which trace the shifting of agricultural industries as influenced by geographic and economic conditions and show the forces which have

caused the changes in the production of the principal crops and the development or decline of various types of farming and farm organizations and enterprises, $15,000.

That is a new item, and I would like to have you tell us briefly what that is about.

Mr. HILLMAN. I would say that although it is a new item it does not represent new work. It is work that has been in progress for years. We are getting to the point of publication of some results of that work which are of unusual importance, and we want to publish it in a form to make it of the greatest possible value to the public. It requires special authorization for publication, because the form is not one of the regular forms provided for by law; so it is necessary to ask for a special appropriation to print it. It is to be a book. This exhibiting is the dummy of the outside covers, showing you the size, etc. The title is, "Agriculture of the United States." We are bringing together here, so far as they are available at the present time, in cooperation with the Geological Survey, the Weather Bureau, the Bureau of Plant Industry, the Bureau of Soils, and a large number of other bureaus, all the available data relating to the present distribution of crops, animals, and other agricultural enterprises in this country, and also the past distribution, and are making a study of the reasons why they have shifted from one place to another. That study has brought a recognition of principles which are of enormous assistance to us in determining what are the legitimate enterprises of a given region.

I will show you just a few of the important things that are represented in this work. Unfortunately, some of it is so small that it will only just look hazy to you. That [exhibiting map] shows the distribution of the population of the world. You will notice the dense population, beginning here in Japan, then extending to China and India. Here is England and northwestern Europe. Here is the United States. That is the population of the world so far as it can be determined.

Here is the wheat production of the world—China, southern Russia, and Italy; here is the United States and here is Argentina. Here is the wheat production in Europe. One of the maps refers to acreage and the other to bushels. This is the bushels of wheat, and this is the acres of wheat. Notice the dense acreage of wheat here in southern Russia, but the small number of bushels, because of the character of the climate and because the people there are only recently being taught how to farm properly. It is not necessary to show you all of these maps, but the agriculture of the world, so far as the data are available, will be published in this smaller form.

Here is some of the material that will go into the larger atlas, relating exclusively to the United States. It will give you an idea of the material in this publication. Here is the wheat area of the United States. The large dots show 50,000 bushels and the small 5,000. Here is a great wheat area [indicating the Red River Valley] and here is the Palouse region, where I used to live—the "inland empire," we used to say. Here [indicating other maps] are the wheat crops extending back to the first census of wheat in 1839. In 1870 it begins to show in California. Here is the map for 1880. Minnesota is b inning to show. At that time southeastern Minnesota was ber an important wheat country. At the present time that

outheastern section of Minnesota has no wheat in it. We have made study of these changes and found out why it now has almost no heat.

Here is an interesting thing. California in 1900 was really an im-ortant wheat center. In 1910 wheat had almost disappeared from alifornia. We made a study of why that occurred, and it has re-ealed something profoundly important.

Here is a very interesting map; so small, unfortunately, that it an not be seen from all parts of the room; but this shows the counties n which wheat increased in acreage in the last 10 years, and this, hose in which it decreased in acreage.

We have maps showing all the crops of the country and all the nimals of the country, the rural population, the soils in so far as oils have been worked out, topography, rainfall, frost, etc.

This publication will give all the facts about the agriculture of this ountry so far as they are known.

Here is the cotton crop of the United States at the last census. You will notice it outlines two parallel strips of country here. Between that is what they call the sand hills down in the Carolinas, where the land is thinner. Below and above the sand hills it is heavier.

Here [indicating western Texas] is the great extension of cotton since the advent of the boll weevil. Here [indicating a series of small maps] are all the cotton crops from the year 1839 up to the present time. In 1859 cotton was extremely dense here in certain parts of Alabama and in the Delta region of Louisiana and Mississippi. Here [indicating] we get practically the first development in Texas in 1889. Here [indicating east Texas] in 1909 the boll weevil had begun to have some effect on cotton.

Here [showing map] is 1914, taken from the estimates of the Bureau of Crop Estimates. You see that cotton has come back in the black belt of Texas and pretty nearly disappeared down in the timber part of Texas, but it has spread out greatly in the dry region of western Texas. The text underneath explains those changes.

The CHAIRMAN. And you have done that service for all of the great crops of the country?

Mr. SPILLMAN. Yes; and even the small crops.

Mr. HAWLEY. How many copies of each of these books will the $15,000 print?

Mr. SPILLMAN. I think there will be 1,000 copies of this book—this big one. The smaller one, on account of its size, can be printed under the regular funds. The special fund is for the larger book. I think the estimate provides for 1,000 bound copies and 4,000 unbound copies. Each crop will be printed as a folio separate, and I think there will be about 4,000 copies of each of these.

Mr. STEELE. Will the Congressmen get one each?

Mr. SPILLMAN. You have the disposal of that.

The CHAIRMAN. The 1,000 copies will go a very small distance in supplying the demand, will it not?

Mr. SPILLMAN. The Geological Survey, which will have the printing of this because of the colored maps (the Government Printing Office can not do that), tell us that they will be able to print this so that the books will cost the Government about $3 apiece, and people who need the books will be able to get them.

Mr. STEELE. Will they be distributed to the high schools of the country?

Mr. SPILLMAN. I do not think there will be enough available for that.

The CHAIRMAN. I was just about to ask if it was the intention of the department to distribute these to universities, agricultural colleges, experiment stations, and the like, or do you intend to make a general distribution? Of course, I know that you can not make a general distribution among schools, for instance, as Mr. Steele suggests.

Mr. SPILLMAN. If the committee thinks that we ought to do that, it will be necessary for us to have more money.

The CHAIRMAN. Yes; undoubtedly.

Mr. SPILLMAN. But our idea is to get this in printed form and a thousand copies of it bound. That will supply a limited call for it by people who necessarily have to have it, and then the separate folios—4,000 copies of them—will supply a great many investigators who are especially interested in a particular thing. We have considered that the people who wanted the publication seriously might pay $3 for it. I expect to pay $3 to get one for myself.

The CHAIRMAN. It just occurred to me that this will be a very valuable publication to the students of agricultural economics, and yet it would not be a very valuable publication for general distribution.

Mr. SPILLMAN. Only the farmer who himself is a student would want it.

The CHAIRMAN. Yes.

Mr. SPILLMAN. The usual type of man who could easily pay the $3 and would gladly do it.

The CHAIRMAN. Now, one other question, and then we are through. Has these data—the maps and tracings that you have here—ever been published? Is it contained in any document now published and in print in this country, or in any other country in the world?

Mr. SPILLMAN. No. I will say this, that there are half a dozen countries who have published atlases like this of their own country. We have in our office a book like this in the Russian language, relating to Russia, and we are so fortunate as to have a gentleman in this department who is a Russian. That makes it an open book to us, so we are able to secure valuable information about methods, but we think this atlas will be an improvement on the Russian one.

That covers our work, Mr, Chairman.

The CHAIRMAN. We are very much obliged to you, Prof. Spillman.

(Thereupon, at 12.30 p. m., the committee took a recess until Wednesday, February 16, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Saturday, January 8, 1916.

The committee this day met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. Gentlemen of the committee, we have met this morning to take up the estimates of appropriations required for the service for the fiscal year ending June 30, 1917.

I want again to urge upon members of the committee the desirability of being present promptly at the hour of meeting, and I want to suggest that some one make a motion that when the committee adjourns that the adjournment be in the nature of a recess from day to day so long as these hearings are continued, in order that we will not be delayed in awaiting the arrival of a quorum.

Mr. LEE. Mr. Chairman, I make that motion.

The motion was agreed to.

STATEMENT OF MR. CHARLES F. MARVIN, CHIEF OF THE WEATHER BUREAU.

The CHAIRMAN. Gentlemen, we will take up for consideration this morning the Weather Bureau. Dr. Marvin, the Chief of that Bureau, is present, and we will ask him to take charge of the hearing this morning.

Mr. Marvin, I will ask you first to take up the statutory roll and discuss that as briefly as you can to make it satisfactory to us, and then we will ask you to take up the general-expense item and discuss that, and then to make any further general statement that you may wish to make.

Mr. MARVIN. Mr. Chairman and gentlemen of the committee, the statutory roll has been changed very little. The first item on that roll has reference to my own salary. I will leave that matter with you, unless there are questions concerning the same, otherwise I shall take up the other items.

The CHAIRMAN. There is proposed an increase of $1,000 in item No. 1, which refers to your salary, and that is, I presume, to bring the salary back to its original status of $6,000 which existed some years ago?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. And which went out in the Senate about two years ago?

Mr. MARVIN. Yes, sir; under the intention at that moment of equalizing the salaries of chiefs of bureaus of the Department of Agriculture.

The CHAIRMAN. I presume, Dr. Marvin, that we had better let Secretary Houston discuss that question.

Mr. MARVIN. He will probably present his views to the committee in regard to it.

The CHAIRMAN. The next change in the statutory roll is in item at page 13.

Mr. MARVIN. There is an increase of one clerk of class 1 in lieu of one telegraph operator in the previous bill at the same salary. There is no increase in the appropriation, simply a change of title. We have seven clerks in the telegraph division. They are telegraph operators, but they have in addition to the telegraphic work a lot of clerical work to perform. The others are all carried as clerks except this one and it seemed proper to transfer this operator to the clerical force.

The CHAIRMAN. These people do double duty as telegraph operators and clerks?

Mr. MARVIN. They audit the accounts for telegrams of which there are an immense number, they check the telegrams, and do additional clerical work in connection with the supervision of the telegraphic work of the service. The Weather Bureau has a few seacoast telegraph lines, and all the clerical work in connection with them is performed in this division.

The CHAIRMAN. How many of these people are located in Washington?

Mr. MARVIN. They are all located in the office at Washington. We have some observers who are telegraph operators in the field, but they are not carried as telegraph operators; they are really meteorological observers, telegraphing being an incidental duty.

The CHAIRMAN. Please take up the next change, which is in item 13.

Mr. MARVIN. The foreman of printing is changed there. The situation is incongruous in having an assistant foreman whereas there is no foreman of printing. This employee is really the foreman of the press room and performs his duties under the Chief of the Division of Printing. He is a foreman and not an assistant foreman.

The CHAIRMAN. At one time you did have a foreman?

Mr. MARVIN. Yes, sir; we had a foreman and an assistant foreman, but the foreman of printing was dropped out and the assistant was left in an anamolous position.

The CHAIRMAN. Please take up the next change.

Mr. MARVIN. The next change is that of the lithographers. When I took charge of the bureau we discontinued the printing of the meteorological charts of the several oceans. We now prepare the meteorological data for these charts, but the printing is actually done at the Hydrographic Office. When this change was made we dropped one lithographer on account of the large reduction in the work. Since that time we have increased the amount of lithographic work that is being put out by the bureau, and it has been necessary to add to the lithographic force to do so. The one additional lithographer is already employed under the language of the appropriation for "pay of additional employees when necessary." We publish the Monthly Weather Review. It is one of our important publications. All these lithographic charts are printed at the Weather

Bureau, necessarily, although the printing of the tabular matter and text and the binding are done at the Government Printing Office. We are also publishing each month a report like this [indicating] for each State, comprising the climatological data for the State. We print the lithographic charts in Washington for that publication.

The CHAIRMAN. Do you print that entire publication in the Weather Bureau, or only the map?

Mr. MARVIN. We print the charts at the central office in Washington. We print the text at the stations, in the little printing offices at our stations. At one time we tried to print the sectional report at the Government Printing Office. The procedure then was to have the observations collected in the different States sent to Washington and edited here, the copy then sent to the Public Printer, and the proof sent back to be revised and corrected and finally printed. Then the publications were sent out to the States. The way we do it now is more expeditious. The old way required at the best something like a couple of months or so to get the publications out. The way we do now is to print these maps [showing one of the sectional reports] in the central office and the text and tables at the district center. The observations first are collected at the center, one for each State. The official in charge, the section director, revises, verifies, and corrects the report, the type is immediately set up at that station, and the report is printed. We send out the maps which are to go with it, thus completing the publication. In most of the States we get the publication out within 25 days of the day the last observation in the publication is recorded, and that makes this information immediately available to the community. This is a much more expeditious and a much more economical way of publishing this work.

The CHAIRMAN. You have really increased the number of lithographers by one?

Mr. MARVIN. Of necessity, because we are doing that lithographic work here in Washington, which could not be done at the Government Printing Office.

The CHAIRMAN. How many lithographers have you now on your lump fund for printing?

Mr. MARVIN. We have one lithographer on the fund for the printing office in the city of Washington.

The CHAIRMAN. Why could not he be transferred to the statutory roll?

Mr. MARVIN. That is exactly the object of the change we are now discussing. We have two lithographers on our present statutory roll, at $1,200 each, and we want to add one more.

The CHAIRMAN. How many lithographers have you employed under the lump fund of $14,000 for printing in Washington?

Mr. MARVIN. Just one.

The CHAIRMAN. And you transfer that one to this item here, or are you going to permit him to remain under that fund?

Mr. MARVIN. We are transferring him. It shows as an increase of one in item 15. We need three lithographers at $1,200.

The CHAIRMAN. If this item is approved, you will have no lithographers on the lump fund at all?

Mr. MARVIN. None, sir.

Mr. ANDERSON. I should like to make an inquiry for my own information. As I understand the situation, whenever there is an

[illegible] by transfers from the lump fund that means an increase of the statutory roll?

[illegible] Yes.

Mr. [illegible]. And the effect of that transfer is to make that employee a permanent employee on the statutory roll?

[illegible] Yes; that is true. Is it not, Mr. Marvin?

Mr. [illegible] Yes, sir.

[illegible] And such a transfer from the lump fund to the statutory roll [illegible] by that amount the lump fund. It does not [illegible] however.

Mr. [illegible] That is correct.

Mr. [illegible]. I notice that there are a good many estimates in which it is stated that the lump fund has been reduced by that amount, when the actual net result is not to reduce them at all.

[illegible] We looked into that very carefully. The clerk of the committee went into the proposition thoroughly and found that where the statement had been made that the lump fund had been reduced that was a fact, but sometimes it does not appear so on the face.

Mr. [illegible]. It is a book reduction; it is not an actual reduction.

[illegible] That may be.

Mr. [illegible]. You speak of making these men who are transferred permanent employees. They are permanent, are they not, when they get paid from the lump sum?

Mr. [illegible] Yes, sir.

Mr. [illegible]. And you will hunt a long time before you will find one dismissed from the service.

Mr. [illegible]. The reason I brought this question up was that I wanted to understand it myself. As I understand the situation, when a transfer is made the employee occupies a permanent statutory position that can not be abolished except by legislation, whereas the employee on the lump fund the employee, the place, and the salary can be abolished without any legislation.

[illegible] Is that correct?

Mr. [illegible] That is at the discretion of the chief of the bureau or division or department.

[illegible] Mr. Anderson stated the case very broadly, that when a man goes on the statutory roll there is no way of getting rid of him except by law, but you have the discretion, of course, to [illegible] from the statutory roll as you see fit.

Mr. [illegible] Yes, sir. I will tell you frankly that we have allowed some positions to be vacant on the statutory roll for a time when the services of those employees were not necessary. Where a vacancy occurred we have in some instances been allowed to lapse for a time and [illegible] to the Treasury. If the time comes later on [illegible] we can fill that vacancy. In the present [illegible] pointed out that this printing fund is not specifically a [illegible] salaries; it is mostly for work, but the following language [illegible] the appropriation for the printing office, "including [illegible] additional employees when necessary." Under that [illegible] during the past year we have employed this lithographer [illegible] employee and we paid for him out of the lump fund. We [illegible] to you frankly and ask that he be transferred to the statutory roll, but we have made a special note that the fund has not

been decreased, because we wish a little latitude in the fund to provide for exigencies of this kind. This printing fund has been very greatly reduced under my administration. It originally was $26,000. We have transferred the charges against that fund to the field expenses of the service, and we have reduced the fund accordingly to $14,000. The appropriation for the printing work is really a small one. It is now proposed to take the lithographer out of this fund and put him on the stautory roll and at the same time keep the $1,200 in the fund, if possible.

Mr. HELGESEN. You say that you have transferred the charges to other services?

Mr. MARVIN. We have transferred the expenditures for paper and printing material that is used entirely in the field to the field fund, where the charge properly belongs. Formerly it appeared in the appropriation as if the money were being expended in Washington, but in fact it is being expended for work in the field.

Mr. HELGESEN. And you have as much money for printing under this arrangement as you formerly had?

Mr. MARVIN. Yes, sir. There has not been an actual reduction in the printing expenses of the bureau. If you go back over the previous legislation, you will notice that we transferred last year $12,000 to the field fund from this printing fund in the city of Washington, reducing the fund from $26,000 to $14,000.

Mr. CANDLER. Making an actual saving in the fund by simply transferring to the field work?

Mr. MARVIN. It is properly a charge against the field work. The amount expended is not literally reduced, but it places the charge for the expenditures on the field funds rather than on the Washington fund. We are not maintaining a $26,000 plant in Washington. We have a plant here that is expending $14,000, and we have an additional $12,000 for printing work being done in the field at 88 stations.

The CHAIRMAN. Your expenditure for printing amounts to $26,000, both in and out of Washington?

Mr. MARVIN. Yes, sir. That is, $12,000 was added last year by transfer from the Washington printing expenses to the sum allotted for field expenses.

Mr. STEELE. I should like to clear up my mind on the question. Is there a desire on the part of the lump-fund employees to get on the statutory roll, and what is the reason for that desire if they receive the same salary?

The CHAIRMAN. If I were an employee in the department, I would prefer to stay under the lump-sum appropriation (I do not know what the desire of the employees of the department might be) because there is more latitude of promotion under the lump-sum fund than under the statutory roll. It is the desire of Congress to transfer as rapidly as possible all employees who can be properly transferred from the lump-sum to the statutory roll. I think a line of demarcation might be stated like this: That if an employee is purely a scientific employee he may be kept under the lump fund; but if he is doing clerical work and the work is of a permanent character, then he should go to the statutory roll. Is that right, Mr. Marvin?

Mr. MARVIN. The chairman has stated it admirably.

The CHAIRMAN. That is the policy of Congress, Mr. Steele.

Mr. OVERMYER. Mr. Chairman, are the statutory employees under the civil service?

The CHAIRMAN. Yes, sir.

Mr. MARVIN. And the lump-sum employees are also under the civil service, as far as that goes.

Mr. HAWLEY. Is item No. 14 a new item?

Mr. MARVIN. No, sir; that is an old item, a lithographer who has been there for some time. The item we are discussing is the change in the number of lithographers at $1,200.

Mr. HAWLEY. There are two, and you desire three?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. The one at $1,500 is somewhat the chief of the others?

Mr. MARVIN. Yes, sir; he is the head man of the lithographers.

Mr. HELGESEN. If a man goes on the statutory roll through the civil service can you, as chief, dispense with his services entirely at any time you wish?

Mr. MARVIN. We can not dismiss him so long as he is performing satisfactory work without preferring charges and going through certain procedure that will justify his dismissal. If his services are no longer necessary to the work of the department he can be dropped without prejudice.

Mr. HELGESEN. Assuming that his services are satisfactory?

Mr. MARVIN. We can not drop him and employ some one else in his place.

Mr. HELGESEN. But you could reduce the force?

Mr. MARVIN. We could, if the exigencies of the work required it.

Mr. OVERMYER. Or he could be transferred to some other service?

Mr. MARVIN. Yes, sir; that would be dropping him without prejudice.

Mr. MCLAUGHLIN. And he would have a year's eligibility in which to return?

Mr. MARVIN. Yes, sir.

Mr. ANDERSON. I understood you to say that employees paid out of the lump fund were under the civil service. I do not think you intended your remark to be as broad as that.

Mr. MARVIN. The civil-service requirement depends on the kind of work that the employee performs. It does not depend on the fund from which he is paid.

Mr. ANDERSON. That is what I am getting at, exactly—whether the position is one in the classified service.

Mr. MARVIN. A lithographer is in the classified service. Whether he is paid from the lump sum or the statutory roll, he must be employed through the Civil Service Commission.

Mr. ANDERSON. You do not mean to say that all the employees paid from the lump sum are appointed under the civil-service rules?

Mr. MARVIN. Not necessarily; no, sir.

Mr. HAWLEY. Your scientific employees are not?

Mr. MARVIN. Yes, sir; all of them are certified by the Civil Service Commission. [illegible] have a certain class of observers which we call special [illegible] local observers and we are authorized by the laws and [illegible] the Civil Service Commission to pay them not [illegible] month for making observations and telegraph- special qualifications are necessary. Often very

eminent people do that work. They do not have to have a civil-service status, and they are paid out of the lump sum. All the regular employees—the commissioned employees that we have—are drawn from the civil-service registers.

The CHAIRMAN. Please take up the next item, No. 17.

Mr. MARVIN. There is a change in order to secure better pay for these employees, the printers in the service. I have stated it here very briefly in memorandum form, and if you will permit me to read it we can get at it quicker.

The CHAIRMAN. Certainly.

Mr. MARVIN (reading):

Compositors and printers: The rearrangement of compositors and printers is for the purpose of equalizing the pay of these employees and making it conform to the rates of pay at the Government Printing Office and in outside printing shops. The bureau has experienced much difficulty, especially at field stations, in retaining capable printers at the present rates of pay, which are uniformly less than the commercial rates in the same localities. This difference causes embarrassment in connection with the labor organizations. It frequently happens that temporary printers have to be employed at our field stations, and we are nearly always obliged to pay the temporary man a higher rate of pay than that paid the regular station man, who not only can do more and better work but must actually supervise and instruct the temporary man who is receiving more pay. This condition should be remedied, as it makes it difficult to retain the services of competent men when they come to realize the conditions that confront them. The remedy proposed by the rearrangement submitted necessitates an increase in appropriation of $4,350.

Briefly, I think that explains the change that we propose in this item.

The CHAIRMAN. It seems from a reading of your note that your increases are out of proportion to each other. You have increased 1 man $40, 5 men $190 each, and 14 men $240 each.

Mr. MARVIN. Well, that may possibly be true. We have one chief compositor receiving $1,400. He might be considered to be entitled to more pay than the other compositors, but we did not feel justified in asking that his compensation be increased to $1,600 and that these remaining printers be increased to $1,440, so we put it in in this way, that these five men should go to $1,440, one of whom is already receiving $1,400. I would be glad to have you increase the chief compositor to $1,600 if you think it should be done.

The CHAIRMAN. The thought in my mind was that we might let that remain and reduce the other printers to the same salary.

Mr. MARVIN. It is a great advantage to have a simple salary grade; $1,440 is a convenient grade. Those men are receiving $1,250, and we should like to have the next salary grade on our roll $1,440, which provides an even per diem rate of pay. This is a great advantage to the accounting officers when they have to adjust questions of pay for part time. It is very convenient then to have all of the per diem rates even amounts.

The CHAIRMAN. Do these employees all do the same character of work?

Mr. MARVIN. Five of them practically do. There is another reason for increasing the field men more than the central-office men. The central-office men are now receiving $1,250. The field men do very much the same work and have been receiving only $1,200. It is in the field that we have dissatisfaction at existing rates of pay, especially in the far West. The commercial printers receive higher

... receiving only $1,200, and we think they should ... $240.

... How many of these compositors ... and how many are central office?

... central office and 14 in the field.

... How will those salaries compare, considering the ... they work, as I presume they do——

... salaries received by printers in the commercial ...

... make them comparable; they will ... to same.

... will be found to compare?

... They are allowed to perform eight hours' labor in ... week, which is two to a commercial ...

... that be ordinary printer in a newspaper office does more than eight hours?

... are not prepared to answer questions ... that be commercial printers ...

... Does not the Government operate?

... Yes, sir.

... What is the rate?

... $3 to $4, or more a day. Our per-annum ... the rate of the per diem rate of the temporary employees. The proposed increase of $1,440 would put the ... on a par with the per diem system and still keep up the ... $1,440.

... understand what you meant when ... $1,440 was easily divisible by a certain number of days ... What number do you divide by?

... a monthly division. It is also a daily ... give you an even per diem. They count 30 days ... year. You will find that that will give ... one day.

... They do not work on Sundays?

... for we do not issue some exigency requires.

... the ordinary work done in the commercial ...

... to be primarily framed on our particular ... printing is not different to ordinary office work and ... work. It is nearly all similar work and work for ... little more than other work. Here exhibits ... kind of work that these field men do. This map which ... exhibiting we prepare at our stations. This ... from telegraphic reports received at 8 o'clock in the morning ... work from the moment the reports are received at ... office until the map is printed. A man sits down the symbols on ... lines. The printers set up the type into the ... operator—that is, the official in charge—prepares this ... printing. We get this out at the earliest possible moment. ... are made every week day. At the end of the month this ... exhibiting climatological reports. That is rush work ... time, and sometimes we have to employ temporary assistants

o get this work out without delay, and at some of the stations we ave experienced this embarrassment, previously mentioned, in the mployment of temporary men. We nearly always pay them more han our own men.

Mr. HELGESEN. Is not that true in all cases and in any kind of ork?

Mr. MARVIN. I do not know whether it is always the case. We ay the temporary man only the local per diem pay. It makes some issatisfaction among our own printers, who feel that they are entiled to the same pay. I think that the temporary man is paid no ore than he could get if he had a permanent job on the outside.

The CHAIRMAN. Have you any list showing the number of changes n your force of printers in the field and in Washington by reason of esignation or anything of the kind?

Mr. MARVIN. I have not such a list with me now.

The CHAIRMAN. Could you make a general statement as to the umber of changes in the service on account of the lack of pay?

Mr. MARVIN. I do not know that we can say that among the 14 en many have quit because of lack of pay, but there is dissatisfac-on, and they feel that they are getting less pay than they are entitled o. The pay is less than that fixed by the union organizations. One f our men in Portland, Oreg., for example, was strongly criticized nd an effort made to make him give up his job. He was a man eceiving only $1,000. In that case at the first opportunity when a acancy occurred on the roll we promoted him to $1,200, because he as so criticized by the trade in the vicinity on account of accepting mployment at a low rate of pay; but even at $1,200 he is getting ess than the printers in outside employment.

Mr. RUBEY. You increase one employee from $1,400 to $1,440?

Mr. MARVIN. Yes, sir.

Mr. RUBEY. And you increase five employees from $1,060 to $1,250?

Mr. MARVIN. No, sir; from $1,250 to $1,440.

Mr. RUBEY. To $1,440?

Mr. MARVIN. Yes, sir.

Mr. RUBEY. I do not get that. You say that you have five com-ositors at $1,250 each with an increase of $190; do you mean that ou add that to the $1,250?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. Please take up items 18 and 19 and discuss them ogether. They seem to be similar. I presume the reasons for the in-reases will be the same as for item 17?

Mr. MARVIN. In asking this increase for the 14 printers in item 7 to $1,440 we have also provided for calling these men, who are now esignated printers, "printers or compositors," with a similar change n the title of the 6 printers at $1,260 each in lieu of $1,000. The in-rease of these 6 printers from $1,000 to $1,260 is asked for exactly he same reasons as obtain in the case of the printers at $1,200 being dvanced to $1,440. These men at $1,000 are employed in the field. They are all receiving too small an amount of pay, and we have icked out that number, 6, to increase, in order to meet this exigency.

The CHAIRMAN. These people do exactly the same character of ork?

Mr. MARVIN. Practically the same, but there is a difference in the xperience and qualifications of the men. These printers enter the

[illegible]

[illegible]

[illegible]

Mr. HAWLEY. Does that apply to compositors also?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. Please take up the next item, No. 21.

Mr. MARVIN. That is a rearrangement of instrument makers for the same purpose as in the case of the printers. These instrument makers are performing important work in the repairing of our meteorological instruments. Some of the men are receiving $1,200 and some of them $1,000. They should have increased compensation. Under this statutory-roll provision it is impossible to increase their compensation from year to year unless Congress does it. We ask you now to make this increase and at the same time to make a rearrangement that will give us five instrument makers at $1,440 in lieu of one chief instrument maker, formerly at $1,400, which is a small increase, and three instrument makers at $1,200 each, with an increase of $240 in each case. That readjustment requires an increase of $1,200, but we will drop one skilled mechanic at $1,000, saving that amount, so that the rearrangement will require a net increase of only $200.

The CHAIRMAN. Do you really decrease the number?

Mr. MARVIN. Yes, sir; one man.

Mr. MCLAUGHLIN. Do you discharge him at $1,000 and then hire him again at $1,440?

Mr. MARVIN. No, sir; one man is actually dropped.

Mr. MCLAUGHLIN. What becomes of him?

Mr. MARVIN. We drop him out of the service.

Mr. HAWLEY. Where in these estimates was he provided for before? I do not see any line with brackets around it indicating his former service.

The CHAIRMAN. That is in item No. 23, is it not?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. I notice that you are increasing one of your men $400. Is not that an unusual increase?

Mr. MARVIN. It does not work out that way in fact. One of the $1,000 men will be increased to $1,200 and one place at $1,000 dropped. There is an increase of only $200 in the adjustment and no man is increased more than $240. One man is dropped.

Mr. ANDERSON. Next year you will submit an estimate for another skilled mechanic?

Mr. MARVIN. No, sir. We are actually dispensing with one mechanic.

Mr. MCLAUGHLIN. You do not abolish the place?

Mr. MARVIN. Yes, sir; there is one less number.

Mr. MCLAUGHLIN. I suppose you sometimes find that the salary of a place is larger than it ought to be and you recommend a decrease in the salary?

Mr. MARVIN. We came very near doing that in the case of this chief mechanician; we have put him up only $40.

Mr. MCLAUGHLIN. You came pretty near reducing him by increasing him $40?

Mr. MARVIN. If we had not been conservative in asking for this increase the chief instrument maker might have been increased to $1,600 instead of $1,440.

Mr. RUBEY. Your favorite salary seems to be about $1,440?

Mr. MARVIN. The men who are performing this work are receiving decidedly too little money. They are men who have been in the

service, some of them 35 years, and none of them less than 10 years. They are receiving this amount of pay, $1,200, and we think they should be increased to that $1,440 grade. That seems to be the place in which the increase of compensation is needed.

The CHAIRMAN. Briefly, what do these men do?

Mr. MARVIN. They are repairing instruments, our instruments. The work is very particular in its character and requires long experience. The market for instruments to-day is worse than it has ever been, because we had frequently been drawing upon the European markets for instruments which can not now be obtained. They have to be made in this country. We have to encourage the manufacture of these instruments, and our own men have to make the models of the instruments that are needed so that the commercial manufacturers can pattern after and produce them, and these men are engaged on that technical work, which requires long experience and special skill and training.

The CHAIRMAN. In items 24, 25, and 26 you have one skilled mechanic at $840, one skilled mechanic at $720, and six skilled artisans at $840 each. What is the difference in the character of the work of these men in these three items?

Mr. MARVIN. The skilled-mechanic grade and instrument makers have a different rating by the Civil Service Commission. These are all civil-service men. The skilled mechanic at $840 performs ordinary labor of a mechanical character.

Mr. RUBEY. Is not the word "skilled" a misnomer?

Mr. MARVIN. We have tried to make the distinction among these skilled mechanics by designating those who are paid a better salary as "instrument makers."

The CHAIRMAN. It seems to me that the word "mechanic" would better represent what they are really doing than "skilled mechanic."

Mr. MARVIN. One is a mechanic and another is a skilled mechanic.

The CHAIRMAN. Is that a civil-service designation?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. What do they do? Please illustrate in one case.

Mr. CALVERT. This $840 skilled mechanic, for instance, is a painter. The $720 man is at present at Mount Weather. He looks after the painting of the buildings and does the general repair work required for the upkeep of the property.

The CHAIRMAN. What class of service do the artisans perform?

Mr. CALVERT. The skilled artisans are engaged in varied lines of work. For instance, one of them is at the cutting machine in the printing office. Two others are in the packing room. It takes more than an ordinary mechanic to properly assort and pack instruments.

Mr. HAWLEY. Is this one that you speak of as being at the printing office at the Government Printing Office?

Mr. CALVERT. No, sir. He is in our own printing office here in Washington. Another one is engaged in general mechanical work at our Drexel station, where aerological work is being conducted.

The CHAIRMAN. Under items 28 and 29 you seem to have five firemen. What do you do with so many firemen?

Mr. MARVIN. We have the Weather Bureau Building at Twenty-
1 M Streets, Government property, that is heated, and the
t is operated by the bureau for the presses and all that.
d light our own property. We have one fireman and

steam fitter at that kind of work in the building and four firemen at $720 each.

Mr. McLAUGHLIN. Does that station supply light and power to any other building except your own?

Mr. MARVIN. No, sir.

The CHAIRMAN. Do you keep the engines going night and day and do the firemen work in shifts?

Mr. MARVIN. Yes, sir. We are on duty in the evening getting out the evening forecast, and so the building has to be lighted and heated until 10 or 11 o'clock, as the case may be, as well as to carry the heat over during the night.

The CHAIRMAN. What about this one gardener? I think we have asked you that question once or twice.

Mr. MARVIN. The same remark applies to the gardener. We have the public grounds of the Weather Bureau to be cared for. He looks after the lawns and the surroundings of the buildings, and in the wintertime does other work.

Mr. ANDERSON. What do the firemen do during the summer time?

Mr. MARVIN. We run the engines in the summer time. We do not heat the building, but we run the power plant just the same.

Mr. STEELE. Can you get a steam fitter for $840 a year?

Mr. MARVIN. Yes, sir. That title comprehends various duties that this man performs. He is not occupied altogether with steam fitting. We call him "fireman and steam fitter" as describing the various duties which he performs.

The CHAIRMAN. Under items 33 and 34 you have four repairmen at $840 each and six repairmen at $720 each. What do these men do?

Mr. MARVIN. They are in the field. The Weather Bureau has a telegraph line along the seacoast, the Norfolk-Cape Henry-Hatteras line, and we have also a telegraph line along the Pacific coast at North Head, at the mouth of the Columbia River, and also at Tatoosh Island, the extreme northwest corner of the United States. These repairmen are employed in maintaining these telegraph lines.

The CHAIRMAN. It seems to me that that is a pretty heavy overhead expense, something like $7,680 for those two lines. How long are the lines?

Mr. MARVIN. I will ask Mr. Calvert to answer that question, if you please.

Mr. CALVERT. The Hatteras-Norfolk line is about 165 miles long. The Tatoosh line is about 80 miles, but it runs through a very heavily timbered country where there are no roads—simply a man trail through the woods. The wires are broken down by falling timbers during every heavy windstorm. It is the only means of communication and the upkeep is rather expensive. Most of the repairmen are employed on the Tatoosh line.

The CHAIRMAN. How many are there?

Mr. CALVERT. We have three repairmen on the Cape Henry line and the remainder on the Tatoosh line.

Mr. McLAUGHLIN. Do you know how these salaries compare with those paid by private or regular telegraph companies?

Mr. MARVIN. We have not the data making the exact comparison with commercial concerns. Conditions are so different. Take the Cape Henry line; no commercial line will go in there, because it is right along the exposed seacoast. If they would go in there we would

withdraw from the field. Hatteras is a very important station on that line from which to get meteorological reports. I may say that during the last few months, through cooperation with Secretary Redfield, of the Department of Commerce, under whose charge come the lighthouses, we have arranged to equip the lightship off Hatteras, out in the ocean some 15 miles, with meteorological instruments, as this lightship will be equipped with wireless and report by radio to points on our line. It is difficult to maintain the Tatoosh line because of its exposed condition. As Mr. Calvert has mentioned, on account of the timber conditions in the West the line is broken and interrupted and these men go out and repair it. The line has to be up just at the time when the storms occur, because it is then the most valuable.

Mr. McLAUGHLIN. I am not familiar with the work of the regular telegraph companies in keeping up their lines, but it seems to me that $7,700 is a large amount of money to expend for keeping up 245 miles of line.

Mr. MARVIN. That charge is not unreasonable under the conditions under which these lines must be maintained.

Mr. CALVERT. I probably can make that clear. These men, in addition to being repairmen are telegraph operators. We have little repair stations at intervals along the lines. They correspond to railroad stations. The repairmen receive weather messages and distribute the information. They also provide the only means of telegraph communication for their immediate communities. There is one little place at Pysht. We keep a man there, as we have to have a station located at that point. There is another one at Twin, just a little settlement; and several more of like character. These men go up and down the line between these points and keep it in condition, and in addition serve as operators.

Mr. McLAUGHLIN. How many also serve as operators?

Mr. CALVERT. Every repairman must be an operator.

Mr. McLAUGHLIN. Does anyone receive any additional compensation on account of the work he does as an operator?

Mr. CALVERT. No, sir.

Mr. STEELE. Does he work for anybody else?

Mr. CALVERT. No, sir; they give their entire time to the Weather Bureau. I think you will find that these men are actually receiving [illegible] they would receive in comparable positions in the commercial world.

Mr. ANDERSON. Do these lines handle private messages?

Mr. CALVERT. They handle both Government and private messages. [illegible] telegraph lines are the only means of communication [illegible] territory in which they run.

Mr. ANDERSON. Do they charge anything for the handling of private messages?

Mr. CALVERT. There is a nominal charge—a uniform charge of 10 [illegible] for individual messages that pass over the Weather Bureau's [illegible]

Mr. ANDERSON. What becomes of that money?

Mr. CALVERT. It goes into the Treasury as miscellaneous receipts.

Mr. ANDERSON. How much does it amount to in the course of a

Mr. CALVERT. It varies. The receipts of the Cape Henry line, I should say, roughly, would amount to $300 or $400 a month, because all of the wireless messages received at Hatteras are transmitted over this Weather Bureau line at 10 cents, in addition to the regular wireless toll.

Mr. HAWLEY. That would be from 3,000 to 4,000 messages a month?

Mr. CALVERT. Yes, sir. At times it is more. During the summer time, when the fishing season is on, it increases very materially, and in the wintertime it drops off. The same condition applies more or less to the northwest line. All the vessels that come in and go out of the sound are reported over this line.

Mr. HELGESEN. What seems to be an excessive upkeep is reduced by three or four thousand dollars a year?

Mr. CALVERT. It is reduced very materially. The amount of tolls from Weather Bureau lines turned into the Treasury for the 12 months ended December 31, 1915, was $5,000.90.

Mr. STEELE. You say, in addition to the 10 cents. Do you mean that the operator gets the balance; that he charges 10 cents additional and that the 10 cents goes to the operator?

Mr. CALVERT. If a message is taken by the wireless station at Hatteras there is a charge for the wireless message at Hatteras, with which we have nothing to do. Then there is the Weather Bureau charge of 10 cents. If a message to some one in Hatteras is filed in Boston with the Western Union Telegraph Co. or the Postal Telegraph Co., the telegraph company collects the entire toll from Boston to Hatteras, including the 10 cents Weather Bureau charge.

The CHAIRMAN. And the 10 cents is turned into the Treasury?

Mr. CALVERT. Yes, sir. If the message is filed at a Weather Bureau office the Weather Bureau operator collects the full toll of the message. If a man at Hatteras has filed with him a message for New York he collects the full toll for the message from Hatteras to New York, which includes 10 cents for the Weather Bureau and 50 cents for the Western Union Telegraph Co. That 60 cents is turned into the Weather Bureau office at the end of each month. On the other hand, when the Western Union Telegraph Co. receives a message at New York that is bound for Hatteras it collects the Weather Bureau's charge of 10 cents, and at the end of the month there is a balancing and exchange. If the Weather Bureau owes the Western Union Telegraph Co. the amount of the balance is paid, or vice versa.

Mr. STEELE. Out of the 50 cents that the Western Union Telegraph Co. gets for transmitting this message, does the operator get the 10 cents?

Mr. CALVERT. No, sir.

The CHAIRMAN. He is paid a straight salary?

Mr. CALVERT. Yes, sir.

Mr. STEELE. Does the 10 cents pay his salary?

Mr. CALVERT. No, sir; it goes into the Treasury. His salary is paid from the appropriation that you are now considering.

Mr. STEELE. This man who is attending to the business of the Western Union Telegraph Co., does the Western Union Telegraph Co. give him a percentage? I know that is usual in other matters along that line, and I was just wondering if that did not increase his salary so that it would be a very important item to him?

Mr. CALVERT. No, sir. In such cases he does not receive compensation from the Western Union Telegraph Co.

Mr. LEE. And he sends the message at 10 cents, regardless of its length?

Mr. CALVERT. Yes, sir.

Mr. MCLAUGHLIN. The entire money that the Western Union Telegraph Co. gives up or pays in any way for the message is 10 cents, and that finds its way into the Federal Treasury?

Mr. CALVERT. Yes, sir.

Mr. CANDLER. The charges amount to about five or six thousand dollars?

Mr. CALVERT. Yes, sir.

Mr. STEELE. I can not see how a man can afford to live on that amount of money out in that country.

Mr. CALVERT. These lines are necessary, not for the purpose of commercial communications but because the weather reports from that region can be obtained in no other way.

Mr. MARVIN. There is just one point in regard to this situation in the Northwest. The Navy Department has one of its most important wireless stations on the Pacific coast at Tatoosh Island. Our telegraph line from Tatoosh Island to Port Angeles is the only telegraph wire outlet for the telegraph work of the Navy in the Northwest.

The CHAIRMAN. Do you charge the Navy for that work?

Mr. MARVIN. No, sir. They transmit Government messages free, as we do, but commercial messages that go over our lines received by wireless from vessels carry the toll of our charge, and the auditing of these accounts is a part of the work of the telegraph division in the central office.

Mr. MCLAUGHLIN. It looks as if the different branches of the Department of Agriculture have to be the "goat" all the time, and if they render any service for another branch of the Government it is done without compensation. If it is property that belongs to the Department of Agriculture that is used there is no compensation for it. We have a matter pending in the House right now where the national forest reserves are to be used for the development of water power, etc., and all the compensation for the use of the land is to go into the reclamation fund. It would seem to me that there should be a proper charge for this service so that the department would get the credit.

Mr. MARVIN. It is not as bad as it seems. The Weather Bureau receives through the Signal Service and through the Navy Department reports from the Alaska section by radio and by wire systems in Alaska that are controlled by the Signal Service and the Navy. We receive messages over those lines every day which would aggregate three or four hundred dollars a month for which there is no charge at all to this department.

The CHAIRMAN. The department certainly should be credited with that amount.

Mr. MARVIN. That is a question of cooperation.

Mr. HELGESEN. I notice here on the various pages that there are explanatory notes. Why do you not insert explanatory notes showing what the receipts are as well as the expenditures for this particular work, for the reason that it would lessen the apparent cost of the service and also furnish us with ammunition for use on the floor of the House?

Mr. MARVIN. That could be done. These notes, you will notice, are put in here only when there is a change in the legislation.

Mr. HELGESEN. I think it would be a mighty good thing to have a note for our information.

Mr. MARVIN. We try to be prepared for any information you want. As to the item we are discussing, in regard to the repairmen, etc., there is no change whatever in the legislation over previous years, and for that reason we have furnished no notes.

The CHAIRMAN. In items 36, 37, 38, 39, 40, and 41 there are a number of messengers and something over 100 messenger boys?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. How many of these employees are stationed in Washington and how many outside of Washington?

Mr. MARVIN. A large majority of them are stationed outside of Washington. Mr. Calvert can tell you the number in Washington.

Mr. CALVERT. The exact number in Washington I do not recollect, but it is approximately 16. It may vary one or two from that number.

Mr. MARVIN. The majority of the messengers are at the field stations. It is their business to aid materially in the preparation of these maps. We have quite a number of messengers at the stations who can set up type to a small extent, and they aid in the preparation of the maps and in their distribution. You can readily appreciate the necessity for messengers in large cities like New York, Chicago, Boston, and New Orleans. We do not have messengers at every station, as you can readily see. The number would not permit. There are nearly 200 principal stations and an aggregate probably of 150 messengers in the field.

The CHAIRMAN. Please turn to page 22 of the bill and take up the matter of general expenses for the Weather Bureau, item 42. The first change I see there in italics are the words "in the Panama Canal, the Caribbean Sea." Suppose you just outline what you propose with that additional language?

Mr. MARVIN. That has reference to the extension of our service in the Caribbean Sea and the Panama Canal region for forecasting purposes. I will ask Mr. Bowie, who is our district forecaster, to tell you something of that service in general—what we are doing and what we want to do, and the necessity for the increase, if you will permit him.

The CHAIRMAN. Certainly.

STATEMENT OF MR. EDWARD H. BOWIE, DISTRICT FORECASTER, WEATHER BUREAU.

Mr. BOWIE. Mr. Chairman and other members of the committee, one of the principal lines of work of the Weather Bureau is that of forecasting hurricanes in the Caribbean Sea, the Gulf of Mexico, and off the South Atlantic coast. It is very exacting work, especially so for the reason that the field is but partly covered by observing stations. It has a threefold purpose; first, to protect the lives of people and property in the South Atlantic and Gulf States; second, to protect the shipping on the waters off our southeast coast from loss occasioned by these terrible storms; and, third, which involves a question of preparedness; that is, to protect our naval fleets in case of war. We had an illustration of that in 1898, when we were at war

with Spain. We had no meteorological reports then from the West Indies, although our naval fleet was off Cuba in the hurricane season. Within twenty-four hours, or thereabouts, after war was declared Congress appropriated, I think, $15,000 to permit us to secure a limited number of reports from the West Indian islands. This service was soon continued. Another instance is that of sending troopships. In the hurricane in September, 1915, the transport *Buford* was at Galveston with a regiment on board, ready to sail for the Panama Canal.

Mr. MCLAUGHLIN. Last September?

Mr. BOWIE. Yes, sir; through the Panama Canal and on to either Honolulu or the Philippine Islands, I am not sure which. We reported to them that a hurricane was approaching Yucatan channel—the channel between Yucatan and Cuba—and we held them in port five days. Unquestionably that transport would have steamed directly into that hurricane had she left port not knowing of the approach of the storm. Those are just suggestions of what this service is intended to do. You know and we all know that the shipping in these waters is going to increase very materially, and it is the duty of the United States, I should say, to provide an efficient weather service in that region. At this time we have in this region stations, as you will see by these symbols [indicating].

The CHAIRMAN. How many?

Mr. BOWIE. Eleven actually maintained by the Weather Bureau. It will be noticed that along the south coast of the Caribbean Sea and the Gulf of Mexico, west to Brownsville, Tex., there is but one station, Willemstad. It is entirely possible, in the absence of reports from those coasts, for a hurricane to form and pass to our southern coasts before being observed.

Mr. HAUGEN. Please give the distance between them.

Mr. BOWIE. It extends from longitude 60° to approximately longitude 100°, or, roughly speaking, 3,000 miles. In our appropriation bill we have asked for an addition of about $30,000 to put in new stations and to pay for cable tolls and for weather reports from vessels at sea by wireless telegraph. We expect to put in several stations in this region, but no decision has been reached as to locations. One station will be placed in the Panama Canal Zone because of its importance. We should have additional stations in the Greater Antilles. Moreover, the stations now in operation report but but once a day, that is 8 a. m. seventy-fifth meridian time. We desire reports from the stations twice a day, so that they will be operated on the same general plan as the weather service in the United States the better to warn of the approach of these storms. I think you gentlemen should grant us this increase. I do not know of any service that would expend a like amount to better advantage.

Mr. HAUGEN. Do you know of any wrecks which have recently occurred that might have been prevented if you had had this service?

Mr. BOWIE. We have had three very severe hurricanes this year. Fortunately they were noted at their very inception, and with the exception of the *Manzanilla*, which was probably lost in the Yucatan Channel, no vessel at sea was lost in these hurricanes.

Mr. HAUGEN. And there may have been very many more!

Unquestionably.

Mr. McLAUGHLIN. You have had for some time an arrangement with foreign stations and with ships of foreign countries to send reports to some of your stations?

Mr. BOWIE. We have a number of what we call vessel stations that report to us by wireless, for which we pay a small amount for each observation and the wireless tolls.

Mr. McLAUGHLIN. Has there not been some kind of an arrangement with ships that carry the apparatus to make more or less regular reports to some of your stations?

Mr. BOWIE. Yes, sir; that is what I had reference to. I had direct reference to the United Fruit Co.'s ships that ply between New York and New Orleans and Central America.

Mr. McLAUGHLIN. Would an arrangement of that kind be continued?

Mr. BOWIE. Yes, sir.

Mr. McLAUGHLIN. There will be no change in that?

Mr. BOWIE. No, sir.

Mr. McLAUGHLIN. That is, if you have these additional stations of your own?

Mr. BOWIE. That is right.

Mr. HELGESEN. Do you have to pay the United Fruit Co. any compensation for that service?

Mr. BOWIE. We have to pay them a toll which is approximately 10 per cent of their commercial toll for transmitting the reports, and we employ their navigating officer to take the observations at 50 cents an observation.

Mr. HELGESEN. With the number of ships which they have would not the benefit which they get be sufficient so that they could afford to render this service to the Government without compensation?

Mr. BOWIE. Yes, sir; but Congress has passed a law prohibiting voluntary service. A person can not work for the Government without compensation. That is literally true.

I want to show you by a series of charts the path of a hurricane that reached Galveston in August, 1915. The symbols indicate the state of the weather. The arrows indicate the direction of the wind. The center of the hurricane is marked low. The lowest pressure is the center of the storm. The barometer is the instrument used for showing pressure of the air. The air flows into the region of low pressure, and by reason of the earth's rotation it gyrates and later grows to the strength of a hurricane. It is simply an atmospheric eddy as is noticed in the tornado of the West. The hurricane is not essentially different from a tornado, except that it is immensely larger. You might compare the hurricane with a 42-centimeter gun whereas the little tornado of the Middle West is simply a rapid-firer.

Mr. CANDLER. It is a cyclone?

Mr. BOWIE. Yes, sir; technically speaking. On the morning of August 10 the hurricane was first sighted over the Windward Islands. On the 11th you will notice that it has moved west. It is carried with the general drift of the atmosphere. In the Tropics the general drift is from east to west. It will be noticed that we have only one station that actually gave us information on which to locate the center of the low. It will be noticed that the arrows show that a gyration of air around the center of lowest pressure has developed.

Mr. McCARTHAN. Please put in the record the exact location of the stations you have.

The statement referred to follows:

STATIONS ON THE ATLANTIC, CARIBBEAN SEA, AND GULF OF MEXICO STATIONS FROM WHICH REPORTS ARE DAILY RECEIVED AND THOSE FROM WHICH REPORTS MAY BE OBTAINED.

Stations now reporting reports.

[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Bahamas.
[illegible] Bahamas.
[illegible]

Port au Prince, Haiti.
Santo Domingo, Santo Domingo.
San Juan, P. R.
Basseterre, St. Kitts.
Roseau, Dominica.
Bridgetown, Barbados.
Port of Spain, Trinidad.
Willemstadt, Curacao.
Swan Island (off Honduras).

Places with which wireless communication will from which 12 or 15 stations will be selected.

[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Cuba.
[illegible] Haiti.
[illegible] Santo Domingo.
[illegible] P. R.
[illegible] Virgin Islands.
[illegible] Leeward Islands.
[illegible] Leeward Islands.
[illegible] Leeward

vessels in the vicinity of the storm center on that day. August 16, it will be noticed, it is approaching Galveston, Tex. From the 10th to the 16th the Weather Bureau had been giving warnings to all shipping and all persons along the Gulf coast of its approach.

The CHAIRMAN. How many days in advance?

Mr. BOWIE. It reached the Gulf coast on the afternoon of the 16th and the first warning was sent out on the 10th.

The CHAIRMAN. Six days in advance?

Mr. BOWIE. Yes, sir. This chart shows that the storm has passed inland and this one shows its entire tract from the time it started down here in the Caribbean on August 10 until it was dissipated in the St. Lawrence Valley on September 23.

Mr. CANDLER. Did you discover that hurricane in time to give notice of it?

Mr. BOWIE. We did not give any notice before it reached the Windward Islands.

Mr. CANDLER. But you discovered the hurricane in time to give warnings ahead?

Mr. BOWIE. Immediately after it was first observed, and six days before it reached the Gulf coast.

Mr. HAUGEN. How do you account for the sudden turn there?

Mr. BOWIE. This is a very interesting problem involving the general circulation of the atmosphere. In the Tropics, the general drift of the atmosphere is toward the west. In the higher latitudes, it is from west to east. The hurricane is an eddy that drifts in the general stream of air just as you see the eddy in a stream of water.

It is unusual for us to have more than one severe hurricane in any one year, but this year we have had three. The first was that at Galveston in August. Another one came along the first week in September, of similar area but of much less intensity, and passed inland near Apalachicola, Fla. On September 22 we had the third hurricane. The first symptoms of it that came to us were over here in the extreme east end of the Caribbean Sea, and notices were immediately sent out to shipping and to the West India Islands. On the 23d it had passed to here [indicating on chart]. We had no station near there, but the general circulation of the winds and the peculiar action of the clouds at these stations along here [indicating] gave us conclusive evidence that there was a storm in that region, and we know it is moving west with the general drift of the atmosphere.

On the 24th it has passed to here [indicating], due south of Kingston, Jamaica. It was encountered on that date by one of the United Fruit Co.'s boats in that region and the boat was badly battered, as it was even then a severe disturbance. The center of the hurricane passed directly south of Jamaica and, as the other one did, followed a west course. On the 26th it has passed to the west-northwest of Jamaica.

If you will permit me, I will read some of the warnings that were distributed when the storm was first sighted: "There are some indirations of a disturbance over the Caribbean Sea [this was on the 22d of September] immediately west of the Island of Dominica." This information was transmitted to Porto Rico and the Windward Islands; also to our coast stations.

On the 23d we said: "Some indications of a disturbance central over the Caribbean Sea in latitude 15° and longitude 67°." This in-

formation was sent to all West Indian stations and important ports on the Atlantic and Gulf coasts, and distributed by naval wireless to vessels at sea.

On September 24 word was sent out: "At 4 p. m. to-day the pressure was low over the Caribbean Sea, and there were indications of a disturbance south-southeast of Kingston, Jamaica, where the wind was east, force 2, and the barometer read 29.74 inches. Strong easterly winds are prevailing in the south coast of Haiti. This disturbance will probably move west-northwest." This information was given a distribution similar to that given the advices of the 23d. I am reading you official information that was given out in connection with this storm.

On September 25 we said: "Tropical cyclone central this morning immediately southwest of Jamaica and moving toward the Yucatan Channel. Vessels bound for Yucatan Channel and western Caribbean Sea should exercise every precaution." This information was distributed to all Atlantic ports, Habana, and vessels at sea by means of the naval wireless.

On September 26: "Tropical cyclone over the Caribbean Sea central south of western Cuba and apparently moving northwest toward the Yucatan Channel. Vessels sailing for the Yucatan Channel and western Caribbean waters should exercise extreme caution." The same distribution was given this information as that of the previous date.

On September 27 you notice it has changed its course somewhat, moving right through the Yucatan Channel. We said: "The tropical cyclone over the western Caribbean Sea is central near and southwest of the Isle of Pines and apparently moving northward. It is dangerous for vessels in western Cuba and southern Florida waters and the Yucatan Channel." This advice was given widespread dissemination to the South Atlantic and Gulf seaports and vessels at sea by means of naval wireless.

September 28: "Tropical storm, attended by dangerous winds, over Gulf of Mexico in approximately latitude 24° and longitude 87°, and moving northward toward the mouth of the Mississippi River. Its influence will be felt late to-night and Wednesday on the middle Gulf coast." At 10 a. m. storm warnings were displayed on the middle Gulf coast, and at 3 p. m. an order to hoist hurricane warnings was sent to the region between New Orleans and Pensacola. This warning read as follows: "Tropical storm center near latitude 26° and longitude 88° and moving northward. Dangerous winds late to-night and Wednesday. Center of storm will probably strike coast near or immediately east of the mouth of the Mississippi River. Advise all interests."

When we give an order to advise all interests to one of our stations, that means that the man at that station goes out and actually advises people. In this case this storm went almost directly over New Orleans. That was on the 29th; the storm began in the morning of the 29th and by evening of that day its center had passed almost directly over New Orleans.

I would also like to say that about 20 years ago—in October, 1893, I think it was—a little hurricane of very much less force than this crossed Louisiana, and there were no warnings displayed. The loss of lives was nearly 3,000. In this case the total loss of lives in

Louisiana, Mississippi, and Alabama was less than 200; yet this was by far, I think, the severest storm that has ever reached the Gulf coast and south Atlantic coast.

Mr. DOOLITTLE. Worse than the one we had in August?

Mr. BOWIE. In intensity; yes. I will show you the track of the September storm. You see it is somewhat similar to the one of August [indicating on chart]. It also disappeared in the St. Lawrence Valley after following that course.

Now, we can do a great deal with $30,000 in that region, not only for the people of the Southern States, but for the benefit of shipping generally in that region.

Mr. MCLAUGHLIN. What will you do with it? Won't you detail for the record just what you are going to do with the $30,000?

Mr. BOWIE. I will explain that. You saw on the other map the stations we actually have in operation. Those in Cuba are maintained by the Cuban Meteorological Service, and elsewhere in this region we maintain them. These green symbols indicate stations that have cable communication, and we expect to place observing stations at some of them that have advantageous geographical positions. The men we have at those stations now are paid a small sum during the hurricane season only.

Mr. LEE. How many new stations could you erect with that amount?

Mr. BOWIE. We could put in, I should say, 10 or 15 stations in the West Indies with that amount.

The CHAIRMAN. That would not involve the erection of buildings down there at all?

Mr. BOWIE. No, sir. The only building that is contemplated is one at the Panama Canal Zone, and that is for the purpose of having a first-class observatory there and to make it the central station for the service in the West Indies. There is an estimate of $25,000 for the erection of such a building at the Panama Canal Zone, which will be found elsewhere.

The CHAIRMAN. It is your plan also to have some stations in the northern part of South America, I understand?

Mr. BOWIE. Oh, yes; along the north shore of South America. We have only one station in that region now.

Mr. HAWLEY. Do the Governments down there maintain any stations at all?

Mr. BOWIE. Very few.

Mr. HAWLEY. Do you have cooperative arrangements with them?

Mr. BOWIE. No. As a rule, we are employing the cable operator to give us weather information.

Mr. LEE. Do you have any trouble in getting permits in foreign countries?

Mr. BOWIE. No; we have had none whatever. The English Government gives us the information from their station in the Bahama Islands and the Cuban station gives us the information for Cuba. We employ the cable operator at Kingston, Jamaica, and one first-class station is operated at San Juan.

Mr. HAWLEY. What do the letters "W" and "C" indicate?

Mr. BOWIE. "C" is cable and "W" is wireless. Swan Island is an important station we put in last year; that reports to us by wireless telegraph.

Mr. [illegible]. Did you say England gave you information?

Mr. Bowie. Yes.

Mr. [illegible]. Does England own a little island there?

Mr. Bowie. They have a station located at Nassau, Bahama Islands. Their agent sends our naval station at Key West their report every day.

The Chairman. This entire service you propose here will cost $50,000 for the establishment of new stations?

Mr. Bowie. Yes.

The Chairman. And $25,000 is the estimate for the plant on the Panama Canal Zone?

Mr. Bowie. That is correct, sir.

The Chairman. That plant will be the gathering point for all of your information, I presume, and the information will then be disseminated?

Mr. Bowie. Yes. And, of course, they will be able to get in very close contact with all vessels going through the canal.

The Chairman. That is the region of very regular hurricanes and storms?

Mr. Bowie. It is.

Mr. Hawley. How many hurricanes have you had there?

Mr. Bowie. We had three in six weeks in 1915.

Mr. McLaughlin. At how many of those foreign stations do you employ our own people?

Mr. Bowie. I do not know that we employ any Americans in these regions.

Mr. McLaughlin. You rely largely on——

Mr. Bowie. The cable operators.

Mr. McLaughlin. Of the foreign cable offices?

Mr. Bowie. Yes; mostly English.

Mr. McLaughlin. Do you employ any men yourselves at any of those stations?

Mr. Bowie. There is only one station in the West Indies where we have a trained observer, and that is at San Juan, P. R.

Mr. Candler. In the cooperation between our Government and the foreign government, does the foreign government get any benefit from us?

Mr. Bowie. We send them warnings.

Mr. Hawley. All vessels passing through that section can take the wireless?

Mr. Bowie. Yes.

STATEMENT OF MR. CHARLES F. MARVIN, CHIEF OF THE WEATHER BUREAU—Continued.

The Chairman. Doctor, your next change in your general language there is the addition of the word "purchase," about 10 lines below the top of page 22. As I understand it, that word went out on a point of order last year on the floor of the House?

Mr. Marvin. No, sir. The word "purchase" has been in the legislation for a number of years. This has reference to the purchase of [illegible] carriages for the Weather Bureau. The Weather Bureau [illegible] of horses and carriages for 40 years. The word was [illegible] in the Senate.

Oh, in the Senate?

Mr. MARVIN. Yes, sir. The language in the legislation was connected with automobiles, etc., and the word "purchase" was left out entirely. We wish to have the word "purchase" restored here, relating to horses and carriages, as it had been in the past. The necessity for that is that the Weather Bureau has property of its own at Twenty-fourth and M Streets, which is distant from the central portions of the city, and we are obliged to transport our mail, charts, bulletins, maps, etc., to the post office, and need horses and carriages for that purpose.

As the language stands, we are provided with the funds for the maintenance of these things, but if a horse dies we can not replace it. And that is exactly what has happened in the past year; one of our horses was taken sick and died. We also had a horse which we found was too old to use. The veterinarians said he was over 30 years old, and on their advice we thought we might as well humanely dispose of him.

Mr. MCLAUGHLIN. I think it was two years ago on the floor of the House that the question was asked as to how many horses the Weather Bureau had.

The CHAIRMAN. Only two, I understand, Dr. Marvin?

Mr. MARVIN. We have one at Drexel and one here in Washington, and that is inadequate. We would like another horse, and it is really necessary that we should have one. We will either have to rent one, borrow one, or do something else in order to haul the mail.

The CHAIRMAN. This will give you authority to purchase?

Mr. MARVIN. This will give us authority to purchase, as well as to maintain the one we now own.

Mr. MCLAUGHLIN. Does that authority to purchase include automobiles?

Mr. MARVIN. It does not include passenger-carrying automobiles for us; no, sir. It requires special legislation for us to purchase passenger-carrying automobiles.

Mr. CANDLER. When you use the words "carriage for transportation of mail," and things of that kind, you mean wagons and vehicles, not a passenger carriage?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. You have the use of a carriage for yourself, do you not?

Mr. MARVIN. Yes. The Chief of the Weather Bureau has a carriage for use for official business and always has had, and there is language in there for the maintenance of things of that kind, but not for the purchase of a horse; or, if a carriage broke down, we could not purchase a carriage.

Mr. MCLAUGHLIN. Has the comptroller considered that in any case and construed the word "vehicle" as covering automobiles?

Mr. MARVIN. I believe the comptroller has, but the legislation requires that we provide specifically for passenger-carrying automobiles if we want one. Congress has the power to sanction the use of automobiles.

Mr. LEE. Would you have use for a truck? You said you wanted to purchase a new horse? Wouldn't it be possible to use a truck?

Mr. MARVIN. A motor truck; yes, sir; but we have to get your permission to purchase passenger-carrying automobiles.

Mr. Lee. But would it not be more economical to use a motor truck for a like purpose in place of two horses?

Mr. Marvin. Decidedly. We would like very much to substitute a motor truck for the two horses, and I think it can be shown that it would be more economical.

The Chairman. If you will propose the language. I think the committee would consider it very seriously. I see no reason for keeping two unemployed horses here.

Mr. Marvin. That would involve new legislation for the department. I should be very glad, Mr. Chairman, if you will permit me, to propose the doing of this work by a motor vehicle instead of horses and carriage.

Mr. Hawley. Do you want automobiles or Fords?

Mr. Marvin. If you give us six or seven hundred dollars, we will buy a motor vehicle or something of the character; but whether it is a Ford or not is a matter for future decision.

Mr. Hawley. Can you give the committee the cost for what you desire?

Mr. Marvin. I should not like to do so now. The initial cost, possibly, will be two or three thousand dollars for the equipment. After that the cost of maintenance will be almost nothing.

Mr. Hawley. You mean for a motor truck?

Mr. Marvin. For the kind of truck we would use. We have looked into the matter of electrically propelled trucks. The initial cost of an electric truck is more, but we have our own electric plant, and in that way the cost of maintenance would be less. An electric truck would cost us from two to three thousand dollars, but it would probably be a better investment than some other less expensive original outlay that would cost more ultimately for maintenance.

Mr. Hawley. What would be the difference in the cost of maintaining horses and horse-drawn vehicles to do your work, in comparison with motor propelled vehicles?

Mr. Marvin. I hardly know, offhand; but I am satisfied that the cost of boarding horses and providing feed for them and giving them medical attention when necessary, and also buying a new one now and then, would exceed that of maintaining a similar service by motor-propelled vehicles.

Mr. Anderson. Are you doing all of your trucking now with one team?

Mr. Marvin. We are for the mail and light work. That is all we have. The drayage and handling of supplies, etc., bought from contractors is not done by the Weather Bureau equipment. The supplies we purchase are delivered by the contractors and hauled away.

Mr. Anderson. What I am getting at is this: You could do a whole lot more trucking with a motor vehicle than you could with a team, and the question in my mind is whether you have enough to make it worth while to purchase and maintain a motor truck.

Mr. Marvin. Yes, sir; we think we have.

Mr. Anderson. If you only have enough to keep employed one team you have not got enough trucking to pay you to purchase and maintain a motor truck.

Mr. Haugen. Do I understand you to say this 30-year-old horse now does the work?

Mr. Marvin. No, sir.

Mr. Haugen. I understood you to say you had two?

Mr. MARVIN. We had such a horse as that that had been carried up to that age, but he was killed.

Mr. HAUGEN. How many horses are required now?

Mr. MARVIN. We want two horses. We now have only one here in Washington.

Mr. HAUGEN. Where is the other?

Mr. MARVIN. We have one horse at Drexel.

Mr. HAUGEN. Where is Drexel?

Mr. MARVIN. Drexel is in Nebraska. That is where we are doing our upper-air work. We want an automobile there very much and we have tried very hard to get one.

Mr. ANDERSON. What for?

Mr. MARVIN. That requires a little explanation. The Drexel station is where we are conducting our investigations in the upper air. It is 5 miles from the railroad station. It is necessarily out in the open air where we can fly kites and send up balloons and make explorations in the upper air. Occasionally these kites break away. We use a wire in flying our kites and, of course, we try not to let them break away; but occasionally we lose a kite and it goes off across the country with this wire trailing along and it is very dangerous, because the kite wire might cross some electric wire and become electrified and create a dangerous condition. Whenever a kite breaks away we chase after it with a horse and wagon, and you can see the advantage of having a rapidly moving automobile. Ordinarily we gather up these kites when they fall to the ground at some not very far distant place, perhaps a chase of several miles, and we could handle that work with infinitely greater effectiveness with an automobile than we can with a horse and wagon, as we are obliged to do now.

Mr. HAWLEY. What do you expect to find in the upper air there?

Mr. MARVIN. We are finding very valuable information concerning the conditions of the air—temperature—the manner in which the air is moving. The work helps us out greatly in better understanding what is going on in the free atmosphere. The ultimate value of the work is reflected in our forecasting. We do not yet fully understand this great problem of the mechanics of the atmosphere. We only understand part of it and are trying to learn more, and the more we learn the better we will be able to forecast.

Mr. HELGESEN. Do I understand you to say that if you had motor vehicles the cost of upkeep would be very small?

Mr. MARVIN. My conviction is the cost to maintain our service by motor-propelled vehicles would be less than to maintain it by our present horses and carriages.

Mr. HELGESEN. This is not for you to answer, of course, but on pages 216 and 217 I notice the cost for maintenance and repairing of automobiles is put down generally from $225 to $250 for each rig, and it looks to me as being somewhat expensive.

Mr. MARVIN. The Weather Bureau is not in that estimate; that is, not for automobile vehicles. We have a motorcycle on the seasoast for our seacoast telegraph linemen and its cost is very little for maintenance. But without having all the facts and without having come prepared to discuss the merits of automobiles as compared with horse-drawn vehicles, I feel I can not give definite data, but I am convinced that we can handle the work more effectively, efficiently, and econom-

cattle with motor-propelled vehicles than we can with horses and wagons.

The CHAIRMAN. I can well furnish us with the language and also a comparative statement of the amount of money needed, the committee will be very glad to consider it, I am sure.

Mr. MARVIN. I shall be very glad to do so, Mr. Chairman.

The statement referred to follows:

STATEMENT RELATIVE TO HORSES, MOTOR TRUCKS, AND AUTOMOBILES REQUIRED IN THE WORK OF THE WEATHER BUREAU.

In the estimates the Weather Bureau suggests the insertion of the word "purchase" in the following connection [illegible] of the estimates. [illegible] was stricken out on the point of order in the Senate last year. [illegible] Weather Bureau has owned, leased, and maintained a few horses for official purposes. The appropriation [illegible] for the maintenance [illegible] horses for official purposes and the purchase [illegible] for horses, but does not provide for the purchase of a horse [illegible]. The bureau now has six horses [illegible] at Washington. [illegible] recently humanely disposed of [illegible] purposes, being 30 years old and no [illegible] The bureau is now obliged to [illegible] for the transportation of [illegible] and has to arrange to borrow [illegible] This is unsatisfactory arrangement. The insertion of the word "purchase" in the estimates will accomplish all the results the Weather Bureau now seeks.

If the word "purchase" is inserted in the estimates [illegible] of the Weather Bureau would have authority [illegible] Secretary of Agriculture, to purchase a motor truck [illegible] for official purposes, but he would not be required to purchase a horse-drawn vehicle or a motor-driven vehicle. It would be the bureau's desire to purchase a motor truck for hauling purposes and [illegible] horses for horse-drawn vehicles, and we would hardly care to make the change. Nevertheless, I am convinced that motor-propelled vehicles for [illegible] purposes would be both economical and efficient. We spend [illegible] annually not less than $800 per annum for the subsistence of two horses [illegible] the needs of the present horse-drawn equipment, not including drivers' services. As all the horse-drawn vehicles are old, they must be replaced at no far distant date. It would be a decided economy if the horses and wagons could be disposed of and one motor truck and one passenger-carrying automobile acquired in their stead. The expense of operation would be almost negligible, especially if an electric truck were used, because the bureau has its own electric power, garage space, and mechanics capable of making ordinary repairs. At the present time, the bureau has no stable facilities and it is necessary to keep the horses and wagons with a near-by livery company, whereas ample garage space is available on its own premises. The first cost, not to exceed $3,000, would be the only item of consequence, and this would be overcome in a short time when the necessity for renewing the present equipment and the large saving in operating expenses are considered.

(Thereupon, at 12:05 p. m., the committee took a recess until Monday, January 10, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Monday, January, 10, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

STATEMENT OF MR. CHARLES F. MARVIN, CHIEF OF THE WEATHER BUREAU—Continued.

The CHAIRMAN. Mr. Marvin, when we recessed on Saturday Prof. Bowie had completed the bureau's statement in reference to the pro-

osed extensions of the weather service on the Canal Zone and the aribbean Sea—or did that complete the statement?

Mr. MARVIN. Yes, sir. And we had really passed after that the atement in regard to the word "purchase" in the language. I ink we had completed that.

Mr. STEELE. Mr. Chairman, that question in regard to the appro- riation of $25,000 for a residence down there at the Panama anal——

The CHAIRMAN. That will come just a little bit later in the esti- ates, Mr. Steele. We will discuss that when we come to it. I am ying to keep this in order.

Mr. STEELE. All right.

The CHAIRMAN. Turn to page 23, item 45, "for necessary expenses the city of Washington incident to collecting and disseminating eteorological, climatological, and marine information," etc. There ems to be a decrease there of $750 due to the transfer of this amount the statutory roll of the Secretary's office, to provide for one- ourth of the salary of an assistant in charge of information.

As I understand it, you now have in the department a man who as charge of gathering and getting out information relating to all ne various bureaus, offices, and divisions of the department, and ach of the bureaus contributes its proportionate share to that xpense?

Mr. MARVIN. That is the case up to the present. We have hereto- ore contributed $750 as our proportion. This proposes to take care f that in the Secretary's office and reduces our appropriation by hat amount.

The CHAIRMAN. Mr. Harrison informs me that four of the larger ureaus are carrying that expense.

Mr. MARVIN. Yes, sir.

The CHAIRMAN. Tell us briefly what that money is expended for.

Mr. MARVIN. That money, $109,250, is for all of the activities in onnection with the work in the city of Washington, except printing work, which is covered in the next item; that is, all the adminis- rative expenses that are chargeable to the Washington office, includ- ng purchase of supplies and equipment for Washington use, the ayment of the salaries of the professional staff in the city of Wash- ngton, and the other expenses of telegraphing and things of that ind that are necessary. The amount is shown in detail on page 26.

The CHAIRMAN. Do you include telegraphing in that?

Mr. MARVIN. A certain proportion of the telegraphic expenses hat are incident to the administrative work. That does not cover elegraphic expenses for station work; but it does cover telegraphic nd telephonic charges in the city of Washington and all expenses or the work of the station in the city of Washington.

The CHAIRMAN. What amount of money are you now expending f the appropriation for seismology? Tell us a little about that, lease. That is rather a new line of work, although it is not a new tem in the appropriation bill.

Mr. MARVIN. The work in seismology costs us very little money. We have only two stations with instruments; one in Washington, nd one in Northfield, Vt. The work requires, in the maintenance f these instruments, but a small portion of the time of the in-

[illegible] Washington and one at [illegible] a number of [illegible] the United States that [illegible] reports each [illegible] collected [illegible] reports from our [illegible] essential. It [illegible] the ships who have [illegible] the whole work is less than [illegible] which you [illegible] which [illegible] years ago. The [illegible] in our [illegible] further instruc- [illegible]

[illegible] that will [illegible] Mount [illegible] northern por- [illegible] Reyes, on [illegible] the great [illegible]

[illegible] here a [illegible] shows that [illegible] work in the city of [illegible] That is for the [illegible] expenditure in- [illegible]

[illegible] the payment of [illegible] and [illegible] located [illegible]

Mr. [illegible] salaries on the [illegible]

The [illegible] appropriation!

Mr. [illegible]

Mr. Hawley. [illegible] detail the pay- [illegible] nearly half [illegible] What ex- [illegible]

Mr. [illegible] the expenses for the [illegible]

Mr. Hawley. [illegible] for supplies and [illegible]

Mr. [illegible] Mr. Colbert to give you the details of the [illegible]

Mr. Colbert. The greater part of the miscellaneous expenses is [illegible] and all of the cable charges [illegible] with the West Indian service. Those, of course, come [illegible] and are chargeable to that fund. So that decidedly [illegible] for telegraphing and cabling.

The CHAIRMAN. Are there any further questions on that item, gentlemen? If not, take up 46, for the maintenance of the printing office in the city of Washington.

Mr. MARVIN. That item, $14,000, is the same as last year, in actual amount. There is an actual increase of $1,200, as explained in connection with the statutory roll, by the transfer of one temporary employee, or emergency employee, to the statutory roll, one lithographer, and the amount of this fund has not been reduced. The amount is small and is for the maintenance of the printing work we do here in the city of Washington in connection with the issue of our weather maps and the numerous bulletins, some of which we showed to you on Saturday. This is the weather map [indicating]. The office is maintained really as a necessity, in order to print these weather bulletins, maps, and information that must be printed immediately. The observations shown on this map were made at 8 a. m. and received in Washington by 9 a. m., or earlier. The forecasts and the indications are prepared, the tables are set up, and this map begins to be printed at half past 10 a. m. This printing office is maintained for this purpose and for printing similar charts, copies of which I had here Saturday but which are not here with me this morning. The work can not be done at the Government Printing Office (this point is sometimes brought up) by reason of the delay involved on account of the physical separation of the offices and the necessity for performing this work immediately on receipt of these observations. The delay would be such that we could not have these maps and charts printed if it were not for this printing office under our own control.

The CHAIRMAN. The same kind of map is printed at a great many of your field stations, too, I presume?

Mr. MARVIN. A similar map, but of smaller size, is printed at about 75 of our field stations.

Mr. HAWLEY. How wide a distribution has this map?

Mr. MARVIN. We issue four or five hundred to be sent out immediately. That map is a very valuable one to scientists and meteorologists, and there is a mail distribution to many recipients who desire the map for its valuable data and for deliberate study. We print about 1,500 copies, I think, each day.

The CHAIRMAN. And from that map is printed a monthly summary, is there not, of your weather service?

Mr. MARVIN. We print the book on climatological data that I spoke of, and we print, during the summer season, a weekly crop bulletin. That is printed weekly in the summer and monthly in the winter. Then we also print a snow bulletin, showing the snow on the ground at the end of the week, during the winter. All of those publications must be printed immediately to be of proper value, and that we do.

The CHAIRMAN. Just for what purpose is this $14,000 expended; for the purchase of paper and upkeep of your machinery, or are any salaries paid out of this fund?

Mr. MARVIN. No, sir; there are no salaries paid out of this fund. Salaries are all paid out of the statutory roll. You notice here the language says "including pay of additional employees when necessary." We have authority to employ men out of that fund if

[illegible] Washington? [illegible] distribution outside of [illegible] European institutions. [illegible] distribution made? [illegible] sent to the [illegible] institution, for instance, and [illegible] sent to new people [illegible] map, showing [illegible] connection with their [illegible]

[illegible] Baltimore has [illegible] process and [illegible] establishments [illegible] Smith for one of [illegible]

[illegible] Mr. Talbert? [illegible] There is the small [illegible] there is the Pearl press, [illegible]

[illegible] large quantity [illegible] we have [illegible] though [illegible] little ones. The rest [illegible] gentlemen who [illegible] that is [illegible] can be found for [illegible]

[illegible] These little establishments, then, would not be [illegible]

Mr. [illegible]

Mr. [illegible] these states would [illegible]

Mr. [illegible]

[illegible]

Mr. [illegible] Washington. We [illegible] to comprise the ex- [illegible] printing office separately, [illegible] Washington, and we have [illegible] for the outside stations.

[illegible]

[illegible] of the city of Washington incident to collecting [illegible] climatological, and marine information, [illegible] climatology, seismology, evaporation, and

[illegible] upon his work

The CHAIRMAN. Have you segregated the sums allotted for those arious lines of work; for instance, meteorology, climatology, etc.?

Mr. MARVIN. No, sir; it would be impossible to do that, except in most arbitrary and imperfect manner. We have about 200 stations in the field. The men at these stations are paid certain salaes——

The CHAIRMAN. Is it 200 or 202?

Mr. MARVIN. The number changes a little bit. I think it is very lose to 200 at the present time. These men are engaged in all of hese lines of works, and they have a certain fixed salary. It is ifficult to say how much salary is devoted to meteorological work, ow much to climatological work, and so on, and we have not atempted to make that segregation, because it would be only an arbirary division if we did so. We can not keep our accounts so as to how the expenses separately.

The CHAIRMAN. At those stations one of your professors might be tudying both climatology——

Mr. MARVIN. And meteorology and marine and river work. Take New Orleans, for instance. It is a climatological center; it is also marine station; and it is also a forecasting district. Now, the offiial in charge is a forecaster part of the time, then a climatologist, nd a few moments later, during the course of the forenoon, perhaps, he may be attending to marine interests, and finally a river problem comes up in connection with the floods of the Mississippi, nd he has charge of all of that work. It is impracticable to segregate the expenses of the different parts of the work.

The CHAIRMAN. You think, then, the best segregation is that which we have in the bill?

Mr. MARVIN. It has worked out admirably so far as we are concerned. The program of work of the department shows the expenses at each of the different stations. This information is not set forth in the estimates, but in the program of work for the department you can find the exact estimated expenses for each one of our stations. We keep an account of how much is spent at each station for all of these activities, but we can not keep an account of the work for seismology, aerology, meteorology, or climatology, or marine and river work separately.

Mr. MCLAUGHLIN. I notice the amount asked this year for each branch of this work is larger than the year before, and that is pretty nearly true as to all of the estimates.

Mr. MARVIN. It is necessarily true.

Mr. MCLAUGHLIN. Have you not found it possible to economize anywhere to try to keep the expenses within the revenues of the Government?

Mr. MARVIN. We have economized to the utmost extent. I might say in that connection that during the past two years the appropriations for the Weather Bureau have been less than those that preceded by $1,000 or more. Nevertheless, we have added very materially to the extension of the work, and that has been done by an economical conduct and rearrangement of the work. But the extension incident to the growth of the service from year to year has reached practically the limit now, and we can not grow any more unless we get a little more money to grow with. The country is able to use the in-

formation that the Weather Bureau furnishes in the conduct of commercial work, agricultural work, and all sorts of activities, and we are called upon more and more for information and assistance. The assistance can only be extended with means, and we have reached, as I said before, the limit to which we can extend the service with the present appropriations. The increases that are indicated in the different items are necessary to the reasonable extension of the work. The reasons for them are set forth in that long note which follows, and have come under a number of different heads.

The CHAIRMAN. Suppose we take that up. Your total increase here is $75,000, as follows: Salaries, $37,060. Let me ask you on that proposition: Is that money to be expended in the increase of salaries, or for salaries for extension of the service?

Mr. MARVIN. That is salaries for the extension of the service. We must have more men to do the work that is the limit.

Mr. MCLAUGHLIN. Is that the allowance? Is that for additional men or have the salaries of some of your men now employed been increased?

Mr. MARVIN. That means additional men, but it means additional men of important qualifications, capabilities, etc., and those men must have to be taken from our own service, from work in which they are already engaged, and put elsewhere with larger responsibilities and more important work. When we give them important new assignments it will be necessary to give them compensation proportionate to their new work, and we will have to fill their places by men from somewhere in the system. This amount is for new men coming in and the increase for salaries necessarily follows.

Mr. [illegible]. We [illegible] $50,000 for the Panama [illegible]. I thought we went over that Saturday.

The CHAIRMAN. We did. I am inquiring about the $37,000 item. Mr. Swank has spoken.

Mr. [illegible].

The CHAIRMAN. What evidence have you to bring before the committee that there is a demand from the country for this extension of the work to that warrant you in asking for an additional appropriation of $37,000 for salaries?

Mr. MARVIN. I can answer that question, Mr. Chairman, by referring to the work we propose to do with this money. For instance, some of this money would go for this extension of the work to the [illegible] Zone which we mentioned Saturday.

Mr. MCLAUGHLIN. Does the $50,000 which you say will be necessary to carry the work there not all of the expense attendant upon that new service?

Mr. MARVIN. Yes; but that is the whole of it is for new service. [illegible] to the $25,000 for a building, which we will come to later.

Mr. SWANK. I thought we had an appropriation further over for [illegible] and the Caribbean Sea!

Mr. MARVIN. Yes; but the argument for that was presented at the hearing on Saturday, and we are now considering the money that has been recommended for carrying out extension of the work explained on Saturday.

Mr. SWANK. As I understood the statement Saturday, it was that this $50,000 was to be used, $25,000 for the construction of a building

at Panama, and $5,000 for the erection of stations at other points, which did not involve necessarily the construction of buildings.

Mr. MARVIN. No, sir; that was a mistake.

Mr. ANDERSON. That was the statement, I am quite sure.

Mr. MARVIN. If the statement was made that way, it was in error. The statement here in the estimates indicates that the $30,000 is for the extension of the work in the Caribbean Sea.

Mr. STEELE. And that $30,000 would cover the entire expenses of that additional service?

Mr. MARVIN. No, sir; because under this item 47, which we are now considering, we can not include a building. This is for expenses other than buildings. There is no appropriation for a building in item 47. We must cover the appropriation for a building in a separate item, so that is necessarily excluded here, and what we are considering now is simply expenses for the additional service, not including the building, and for the pay of the observers at those stations, for the telegraphing of the reports and the collection of the reports from wireless equipped vessels, and for the necessary instrumental and miscellaneous expenses incident to the whole work.

Mr. ANDERSON. Where does the estimate for that work come, then?

Mr. MARVIN. That will come later.

The CHAIRMAN. On page 25.

Mr. MARVIN. You will have a chance to consider the building by itself on page 25.

The CHAIRMAN. By the way, while you are on that page, Dr. Marvin: I notice under your subhead 4 there this language:

For increasing the compensation of the field employees of the Weather Bureau, $15,000.

Is that $15,000 to come out of this $37,060 back here, which you are now discussing?

Mr. MARVIN. Yes, sir; that is to come out of the $37,060. That is a part of that $37,000.

The CHAIRMAN. So that, really, practically half of that increase is for the increase of salaries of field employees?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. And the other half, or a little more than half, would be used in the employment of new and additional men?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. What portion of that $37,060 would be included in your extension work in the Caribbean Sea and the Panama Canal Zone?

Mr. MARVIN. The estimated amount that we have used in making up this total is $12,200 for the Caribbean Sea extension on the salary proposition. That is for new men who are going into the Caribbean Sea region and the Canal Zone to maintain the service in that region.

The CHAIRMAN. Then that would leave $12,200 as the amount for the Caribbean Sea work, $15,000 for the increase in the salaries of field men, which would amount to $27,200, and leaving $10,000 for the employment of additional men in continental America, you may say?

Mr. MARVIN. Yes, sir; that is it exactly.

The CHAIRMAN. Are there any further questions on that particular item? If not, take up your next, "For special reports, $11,370."

Mr. MARVIN. That is like the salary question. You see, the total addition there for the special reports. That amount covers the addition for all special reports in the Caribbean Sea, in the Alaskan extension, and in the extensions in the United States that are comprised in the separate items. I think the matter will be most clearly understood if we follow along the separate items, one, two, three, and four, there, because we consider each one of those items in the increases independently. For example, I said to you a minute ago that the salary increases for the Panama Canal extension was $12,200. The increase for special observations and reports from that region is $5,170, telegraphing is $9,500, and instruments and equipment is $3,130. Those items combine to make this total increase of $30,000 for the extension in the Gulf and the Caribbean Sea.

Now, in the extension work in the United States, which is comprised in paragraph 2, on page 24 of the notes, we have provided for certain extensions there. The first item there is the fire-wind forecast work of the United States. I have this little chart here which will help, perhaps, to make this matter clearer [producing chart]. During the past two years the bureau has undertaken, in connection with the Forest Service and the forest associations in the various States, to issue forecasts of wind force and direction, so as to aid the employees of the Forest Service in guarding against and fighting fires. Such fires result in enormous loss each year during the hot, dry season. It is of great benefit to the forest rangers to know when the dry winds, in excess of a certain force and from certain directions, will occur, in order that they may deploy their men to the best advantage. This is especially true when forest fires are already under way. The forecasts issued by the Weather Bureau for this purpose have been very close and their value has been demonstrated beyond question. However, it is not possible to do more than a limited amount of work with our present resources, and it will require additional employees and funds to permit the work being extended to a large number of reserves where forest-fire forecasts can be used to advantage, and especially the stations in California, Washington, Montana, Oregon, and Idaho.

That is, very briefly, an outline of the work. The region is shown in these blue patches on this map. This work was undertaken two years ago, and it is one of the works of extension I referred to a moment ago which we have been able to put in without additional appropriations. It was started two years ago, beginning in Oregon, in cooperation with the forest agencies there. You know that the Forest Service is now provided with means for preventing forest fires or putting them out if they have already started, and this service is in cooperation with them, to aid in the better management and conduct of that work by giving them advance information of what is likely to happen, what the conditions are to be after a long dry spell, for example, and when warm, dry winds are likely to blow over the forest with great force and fan any incipient fires into flame, thus aiding to make a great conflagration. If the forest agencies fighting the fires know in advance, they can be better prepared.

Mr. HAWLEY. That is, you distribute this information to the superintendents of the different ranges or forests and they phone them to the different men?

Mr. MARVIN. They send them out to their men in the field who are watching at their lookout points.

Mr. HAWLEY. Have you had any reports from those men in the field as to what percentage of the forecasts of the direction of the wind was accurate?

Mr. MARVIN. We have correspondence with the forest agencies in the West commending this work, and they are urging us to extend it so as to give them more of it. We are only too anxious to do the best we can, because the economical value of this service to the Government is tremendous in the forested areas.

Mr. HAWLEY. Where are the observations made that are sent out to the men in the field?

Mr. MARVIN. We get the observations from our weather maps, but we want supplemental observations from all of those forest districts in order that the forecaster may understand the local problems better. That is what we want this money for—to get the supplemental observations in the forest regions. The observers will be mostly employees in the Forest Service.

Mr. HAWLEY. Do you remember how much that service costs out of this $20,000 for the work under paragraph 2 here?

Mr. MARVIN. We have not any exact estimate of the cost for this service, because it has been conducted with the force we already had. We have not put any additional force on it, but we have simply assigned this much additional work to the men and have added some to the telegraphic cost for the dissemination of those messages. But not much expenditure has been made for this work thus far. The money asked for—$20,000—we want for additional men to take charge of this work and study the problem and develop it and to travel in these regions and establish instruments for special observations. The information will be necessary and helpful to the forecaster at Portland, San Francisco, Denver, or elsewhere in making the forecasts. As I say, the economic value of this service is very great, because, if it does not prevent these fires, it helps to lessen the loss by foretelling the conditions of weather that are likely to favor forest conflagrations.

Mr. HAWLEY. Have you any statement as to the number of successful forecasts; that is, how many times the wind blew in the direction it was reported to blow from?

Mr. MARVIN. We have reports from them, but you must bear in mind that this has only been in operation one or two summers, and the number of reports of forecasts that have been made has been relatively limited.

Mr. HAWLEY. The reason for asking that question is that in the Cascade Mountains especially local conditions cause the winds to blow adversely.

Mr. MARVIN. That is exactly what we want to know.

Mr. HAWLEY. They blow sometimes in one direction on one side of the range and on the other side in another direction.

Mr. MARVIN. The money is needed in order to send men and instruments into those localities in order to get the local directions of the wind in and correlate the same with the general flow of air indicated on the weather map and by our other reports. That is the information we need to develop this work.

[illegible] in order to have the local reports sup-

[illegible] the local reports supplement the general re-
[illegible] the general conditions of the weather

[illegible] forest rangers able to do this work?
[illegible] They can make observations for us, but
[illegible] forecasting and the meteorological part of the

[illegible] Why not? Would not they be educated without

[illegible] The forecasting has got to be done in the
[illegible] have a map of this character, showing
[illegible] for the region, and it is his business to
[illegible] of the general atmospheric conditions, so that he may
[illegible] going to rain in the next 24 hours and the direc-
[illegible] going to blow. Those forest rangers are
[illegible] part of the forest where the lookout stations are,
[illegible] not in a position to do forecasting. It is for the
[illegible] to get this general information and supply
[illegible] with it, but we can do us by making observations in
[illegible] the conditions that prevail right at that spot. It will
[illegible] for the forest rangers or others to attempt to do this
[illegible] work. That is our part of the problem, just as it is their
[illegible] work to discover and put out the fire. It is cooperative
[illegible] between the two services, and when we work together we can
[illegible] to each other.

Mr. HAUGEN. Forecasting work is scientific work that requires *years of training and investigation?*

Mr. MARVIN. Decidedly.

Mr. WILSON. If you have already gone over this, I will not ask you to repeat it, because I am a little late, but how many forecasters have you in the service now and how many do you want under this bill?

Mr. MARVIN. We are not asking for any more forecasters under this bill now. We have a forecasting center in Washington. We have two forecasters on duty forecasting for practically the whole region east of the Mississippi River, except a little section including Louisiana; another forecaster on duty at Chicago, who forecasts for the extreme northwestern region here [indicating on chart]; a forecaster at Denver, who takes care of the region in the vicinity of Denver; and two forecasters on the Pacific coast. We are not asking for additional forecasters for this work but for field agents to supplement the work of the forecasters by getting additional observations.

The CHAIRMAN. Are there any further questions on that item, gentlemen?

Mr. WILSON. Has he told us how many extra field agents he wants?

Mr. MARVIN. In the item here for salaries covering this extension work we have $5,000. For special observations and reports—that is, where we have to pay an individual out in the field to make reports for us, $7,000 is required. The amount these employees re-

ceive is $25 a month as the maximum. For telegraphing and telephoning we ask for $3,500, and for equipment and miscellaneous expenses $4,500. Those are the items that go to make up the $20,000. That is for the fire-forecast warnings.

The CHAIRMAN. You regard that as important work, do you?

Mr. MARVIN. I think we could not invest the money more profitably than that. You are aware of the tremendous loss of timber values by forest fires, and this certainly will serve to reduce some of that loss.

Mr. STEELE. There is one question I want to ask you, and that is: Do you ever carry over any funds? Is there any amount you have had left over in the appropriation which you did not consume within the year?

Mr. MARVIN. If it is not all consumed, it goes back into the Treasury. It is turned into the Treasury at the end of the year. It does not carry over.

The CHAIRMAN. Mr. Steele wanted to know if you ever did turn any money back into the Treasury. As a matter of fact, you have?

Mr. MARVIN. Oh, yes. We repeatedly turn in considerable amounts.

The CHAIRMAN. Not enough to make anybody's head swim; but you do turn some back?

Mr. MARVIN. It goes back into the Treasury.

The CHAIRMAN. Take up your next item.

Mr. MARVIN. The frost-warning and river and flood work of the bureau. There is a small item for extensions there of $15,000, which is the total increase asked in that item. That is in order to keep up with the growth of the service. That is all it is. It does not mean new work, but is necessary in order to keep up with the program we already have.

Mr. HAWLEY. I have been doing a little figuring over here on pages 32 and 33. If my figures are not in error, you have 886 river observers. What do they do and why are so many needed?

Mr. MARVIN. Those observers report the stages of the river at their particular stations. They also may make rainfall observations to use in conjunction with flood-warning work. They report to us the height of the river in the channel with a gauge; and that is for all the rivers on which we conduct river work. That information is used in connection with flood warnings along the rivers. In order to know whether we are going to have floods, we must always know the height of the river upstream. Those observers receive from six to seven dollars a month only.

Mr. HAWLEY. Some of them receive more than that?

Mr. MARVIN. The maximum pay is $25, but the average is only about six or seven dollars.

Mr. WILSON. How many did you say there were?

Mr. HAWLEY. Eight hundred and eighty-six, if my addition is correct.

Mr. CALVERT. We have 468 special river observers and 170 special rainfall observers. The river and rainfall observers work in unison. The rainfall observers are not located actually on the streams, but in the watersheds.

Mr. HAWLEY. How many river observers?

Mr. CALVERT. Four hundred and sixty-eight. You are probably confused by a combination of the totals of the two columns.

Mr. HAWLEY. I have gone over pages 32 and 33, the four columns where you have the total for the river observers. On page 32, in the first column I find 177 and in the second 173.

Mr. ANDERSON. Then you have just doubled it.

Mr. MARVIN. Oh, yes; that is the trouble.

Mr. HAWLEY. Oh, yes; I have.

The CHAIRMAN. One is the appropriation for 1915 and the other is the estimate for 1917.

Mr. HAWLEY. That is right.

Mr. MCLAUGHLIN. The small salary paid these men would seem to indicate that they are not employed in this work all of the time.

Mr. MARVIN. That is true. The service they render us is an observation that requires only a small amount of time.

Mr. MCLAUGHLIN. Are they men who are employed in some other line of work for you?

Mr. MARVIN. No, sir; that is all the money they get from the Government.

Mr. OVERMYER. They are usually merchants?

Mr. MARVIN. Merchants or private citizens or river men.

Mr. OVERMYER. I know in my town we had a druggist take care of that work for a good many years.

Mr. MARVIN. Yes, sir.

Mr. WILSON. Are they under civil service?

Mr. MARVIN. No, sir. This money is all they receive from the Government for any service whatsoever, for there is a law that prevents us paying money to a man who receives money from some other Government source.

Mr. HAWLEY. How often do they make reports; daily?

Mr. MARVIN. Not necessarily. In some cases they make daily reports, such as when the river is at a certain stage or when there has been rainfall of a certain amount. It depends on the exigencies or the meteorological conditions at the time.

Mr. HAWLEY. Your next largest number under this seems to be snowfall observers.

Mr. MARVIN. Those are the snowfall observers in the remote mountain regions, in the West chiefly. The snowfall work in the West is of great value in connection with water supply in the western regions for irrigation purposes and for the reclamation of semiarid lands. The engineers in charge of great reservoir projects want to know how much water there is in prospect for them, and we are trying to get this information of the available water in the western half of the continent for all purposes; also of the water available in connection with floods of the western rivers, in Colorado especially.

Mr. MCLAUGHLIN. How many men do you have engaged in this snow-forecasting work?

Mr. MARVIN. That work includes simply the collection of observations.

Mr. MCLAUGHLIN. It is not forecasting; it is the actual investigation of conditions as they exist. How many men are employed in that work?

Mr. CALVERT. One hundred and seventy-eight.

Mr. McLAUGHLIN. And what is their pay?

Mr. MARVIN. That runs from $6 to $10, or $15 in some cases, according to the hardships connected with the making of the report in the particular case.

Mr. HAWLEY. Are they required to go out into the mountains?

Mr. MARVIN. Yes, sir. They are in the mountains. We try to find people in the mountains. The difficulty now is that we can not get enough observers located in the mountains. We take those persons resident at desirable points or occupied there in some way, in connection with mining work or possibly connected with some irrigation work, and ask them to report to us, and we give them this small pay in return.

Mr. HELGESEN. $6 a what; a day or a year?

Mr. MARVIN. A month. We are not allowed to pay any of those men in excess of $25 a month, and for the special meteorological observers the highest salary we can pay is $25 a month. That is a civil-service requirement.

The CHAIRMAN. Have you spoken of frost warnings and the results you are getting from some of that work?

Mr. MARVIN. The frost-warning work is also shown on this chart. The deciduous and various other fruits, the citrus fruits, are shown by these little patches in colors; also the cranberry interests, at certain localities.

Mr. OVERMYER. And do not forget the cherry interests in Ohio. We get frost down there.

Mr. MARVIN. We have a very extensive service in Ohio in connection with the deciduous fruits. That work is like this, we give the horticulturists, truckers, and garden people warnings of frosts that may destroy their crops. If they are prepared to protect those crops by artificial methods, such as heating or by flooding their cranberry marshes in the case of cranberries, or otherwise protecting the growth, they are often able to save their crops.

Mr. WILSON. How do you give those warnings?

Mr. MARVIN. By telegraph. We telegraph that a frost is coming.

Mr. WILSON. Do you telegraph from Washington?

Mr. MARVIN. We do in this district. We telegraph from New Orleans in that district, from Denver in that district, and from San Francisco in that district [indicating on chart]. The local forecaster having charge of the immediate locality receives the warnings in the morning and telephones it to the growers or their own organization, and they prepare in the evening to fight the frost during the coming night. They must have this advance information. We send it to them when they are prepared to protect their crops. Millions of dollars have been expended in California in installing oil-heating devices through their orchards, and they are prepared there, when we give notice that a frost is coming, to send men into the orchards at night. They have their fire pots all ready, and at the proper time they light them and actually warm up the orchards, and the entire crop is kept warm during the night and until the next day comes, and by that means the crop is saved.

Mr. RUBEY. It might be well for you to explain how you send out this information. For instance, of course you can not telegraph it to each individual.

Mr. MARVIN. Take San Francisco, for instance. Our man stationed there telegraphs to Los Angeles and Los Angeles is in telephonic communication with the growers and the citizens' organizations. We disseminate the information to certain centers of the orange and lemon districts, and the growers' organizations themselves further distribute the information among themselves at their own expense.

Mr. HAWLEY. Might I answer Gov. Rubey's question by an illustration? The Weather Bureau saved the fruit industry in one of the best sections in our State, Oregon, in the Rogue River Valley. They got an official warning from Portland, and then they have a local man there and in the frost season someone remains in that office all night. They have telephonic communication with every grower, and that man watches the telephone and gives the report to the different parts of the valley where any portion of the frost is likely to strike, and the men go out and set off their smudge pots. Otherwise, it would be impossible to grow fruit there with any certainty.

Mr. MARVIN. It is the economic value of this work that justifies the expense we put upon it.

Mr. DOOLITTLE. Does the smudge pot really raise the temperature, do you know?

Mr. MARVIN. Yes, sir. They burn crude oil, wood, and coal.

Mr. HELGESEN. Is the benefit derived from the heat or from the smoke?

Mr. MARVIN. It is from both. The smoke layer that overspreads the region prevents the radiation of the heat upward that otherwise would take place. The smoke lessens the loss of heat, so that the ground does not continue to cool off, and the heat from the burning fuel also keeps the temperature from falling as it would otherwise do.

Mr. HELGESEN. In the Northwest they used to recommend smudges, where the only virtue would be in the smoke itself.

Mr. MARVIN. But it has been found that the heat value of the fuel is also an important element.

Mr. HELGESEN. But the smoke from the smudge pot itself would contribute?

Mr. MARVIN. Yes; it contributes, but the heat effect is more beneficial than the smudge.

The CHAIRMAN. How long in advance can you forewarn those people?

Mr. MARVIN. Warnings are sent out, as a rule, in the morning, covering a frost that will come the next morning. That is usually a sufficient time. There are sometimes conditions that will bring a frost to-morrow morning, and it will also repeat itself so that there will be a frost the next day and the next night. That is the greatest tax on the resources of the horticulturists and growers because they have to replenish their fires and to have a sufficient quantity of fuel available. The Southern Pacifice Railroad Co., in Los Angeles, is in full cooperation with the growers in this work and have arranged so that they make oil deliveries immediately to those orchards and growers who are near by, in order that they can replenish their supply.

The CHAIRMAN. That is very interesting. Is there anything further on that item? If not, take up the other item. You have discussed river and flood work.

Mr. MARVIN. The river and flood work is comprised in that whole expense. Fifteen thousand dollars covers a small extension in those lines of activity. This is simply a growth of the service with the growth of the country and the use that is being made of it by the agriculturists.

The CHAIRMAN. Your next item is paragraph 3, for the extension of the work of the bureau in Alaska, which will require $10,000.

Mr. MARVIN. Yes, sir.

The CHAIRMAN. There was nothing further on that other proposition, was there?

Mr. MARVIN. On this Alaskan extension work I have prepared this map [producing map]. You all know a great deal about Alaska. That is a map of Alaska, as shown in blue, on the map of the United States. It indicates the enormous extent of that country. Each State in the United States is a climatological unit with us for the collection of temperature, rainfall, and weather conditions. We want to make Alaska one of those climatological units, and we want to add to the service on account of the growing importance of Alaskan matters. We already have quite a number of stations in this Territory that report to us by mail. There is no expense involved in that, as these observers report without compensation of any kind. These heavy red circles show the points from which we get reports by cable or telegraph.

The Alaska telegraph and cable lines are now in the hands of the Signal Corps of the United States Army, and the wireless service is in the hands of the Navy. We get telegraphic reports for that region without any cost whatsoever. The actual cost would be around three or four hundred dollars a month, if the reports were furnished through a commercial service.

At the present time there is no section director or any officer of the Weather Bureau located in Alaska at all, and we are obliged to conduct this work there by correspondence with Washington or through the Seattle station. We want to have one station up there with a trained Weather Bureau official on duty, in order to look after our interests in this great Territory, and to get more observers, and to see that those who are reporting to us are doing the work entirely satisfactorily and properly.

Mr. HAWLEY. What interests do you expect to serve up there? What good do you expect to do?

Mr. MARVIN. We want to know the climatology of the place, for one thing. The railroads are going up there, mining operations are being extended tremendously, and there is a certain amount of agricultural work that is being conducted, and the bureau is appealed to time and again for information as to the climatological conditions. We want to collect more climatological data and information than we have from that region, and we want to print it in a shape such as we have for the States and for the United States and to turn it over to the people as they need it. The Government is building a railroad in there, and we will probably put the central station at the terminus of the railroad down in here [indicating on chart].

Mr. MCLAUGHLIN. What is the name of that place?

Mr. MARVIN. Seward, I believe, is to be the coast terminus of the Government road.

The CHAIRMAN. Would your observations in Alaska be of any service to you in the determination of weather conditions in the United States on the western coast?

Mr. MARVIN. I was just coming to that. We want additional stations here giving us telegraphic reports. Heretofore we have been limited to those reports that the telegraph companies furnish us, and, as the telegraph service is extended, we want to get more reports in this section because this is really the breeding ground, up here in Alaska, for storms which move down to the northwestern portion of our country and come over in there, in the northern area of the United States [indicating]. We get the first information, of the conditions that are changing, in Alaska, and we want the telegraphic reports in addition to the climatological service.

Mr. HAWLEY. I though on a former occasion you stated that in the section east of Alaska, in Canada, the weather conditions arose there that affected the northern part of the United States.

Mr. MARVIN. The storms come down in this way, through the western Canadian Provinces. Alaska, of course, is the northern terminus. That is away up in this corner [indicating]. These storms come down the Pacific coast. We would continue to get the reports from northwestern Canada as we do at the present time.

Mr. HAWLEY. And join these with those?

Mr. MARVIN. Yes. We want to supplement those with reports from the frontier, so to speak, farther over.

The CHAIRMAN. You ask $10,000 for that. That would include telegraphing?

Mr. MARVIN. That would include everything. There is $4,860 for salaries for supplemental observers and for reports. For these special observers sending telegraphic reports we would use $1,200; for telegraphing and cabling, $900; and for miscellaneous supplies, $3,040, making up the total.

The CHAIRMAN. You do not provide for any buildings up there at all?

Mr. MARVIN. No, sir. Now, these items of increase, as I mentioned at the beginning, are added together to make the total increase under item 47. They go to make up the total increase in the amount for each particular part of the work, as set out in the note accompanying that item.

Mr. HAWLEY. That is $75,000 in all?

Mr. MARVIN. In all; yes, sir.

The CHAIRMAN. Do you care to discuss subdivision 4, for the increase in compensation of field employees of the Weather Bureau, $15,000?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. I think it would be very well to give us a little information on that question.

Mr. MARVIN. This item, I think, is a very important one, and I hope you will give it your sympathetic consideration. If I could bring before you some of the pathetic appeals that I receive as Chief of the Weather Bureau for the increase of pay of deserving men at our field stations you would learn to realize the real situation and the difficulty many of our best men experience in meeting the unavoidable expenses of living on the small salaries we are now paying. Only a short time ago an important official of the department, en-

gaged in agricultural work, and who has spent a good deal of time among the Weather Bureau men at our field stations, in order to collect meterological and climatic data needed in his work, made the following entirely impromptu and unsolicited statement, namely:

It is my belief that the Weather Bureau secures a higher standard of men for their pay than any other bureau of the department, and, so far is I know, the Government service.

I believe that is really true and that the Weather Bureau pay is really below the standard for similar lines of scientific work.

The Weather Bureau officials throughout the country are rendering a very valuable service, often involving the lives and welfare of thousands of people and the protection of property of enormous value. This service permits of no failure, interruption, or delay, either for Sundays, holidays, or conditions of the weather. On occasions of great storms, floods, etc., the service becomes doubly exacting, and the men remain on duty for many hours, day and night. Calls for information by telephone and otherwise become numerous, and only the most necessary routine work of the local office can be performed for two or three days at a time. The office is frequently kept open night and day, Sundays and holidays alike, when the conditions require it.

I have a table here which shows the various salary grades under the lump-sum appropriations of the Weather Bureau, the number of employees in each grade, and the length of service of those in the various grades. I would like to have that go into the record, as I think it shows a very undesirable state of affairs and a condition that does not exist in other scientific branches of the Government. The employees are enthusiastic in their work and give their best efforts and entire time to the public service. It is discouraging to them as well as to the administrative offices of the bureau, because lack of funds prevents financial recognition of long, faithful service. It should be especially noted that but one employee receiving $1,200 or more has served less than five years, while the average service of those in the $1,200 and higher grades is in excess of 15 years. I hope you will study this table when it comes in the record. For instance, we have 75 men who have been in the service over 30 years, and the average pay of those men is $1,760.

Mr. HAWLEY. What do you propose to make it?

Mr. MARVIN. We would not expect to increase any of them more than $200. We want to make increase all along the line in small amounts.

Mr. WILSON. Do they have any other work to do except this?

Mr. MARVIN. No, sir; they devote their whole time to this work. And, as I say, in periods of stress of weather conditions, floods and destructive storms, they are on duty day and night practically.

From 26 to 30 years there are 51 men who have an average compensation of $1,518. With a service of from 21 to 25 years we have 28 men receiving an average compensation of $1,473; from 16 to 20 years, there are 47 men with an average compensation of $1,521; from 11 to 15 years, 81 men having an average compensation of $1,386; from 5 to 10 years, 106 men receiving an average compensation of $1,045; and under 5 years, 74 men with an average compensation of $923.

Now, those rates of pay are not commensurate with the service they are performing.

(The statement referred to follows:)

Statement showing salary grades and length of service of field employees of the Weather Bureau on the lump-fund roll.

Salary grades.	Length of service.							Number of employees in grade.
	Over 30 years.	26-30 years.	21-25 years.	16-20 years.	11-15 years.	5-10 years.	Under 5 years.	
$2,500	3	.....	1	.....	.....	1	.....	5
2,250	1	.....	.....	.....	.....	.....	.....	1
2,000	1	.....	.....	.....	.....	.....	.....	1
2,880	4	.....	.....	.....	.....	1	.....	5
2,750	1	.....	.....	.....	.....	.....	.....	1
2,500	5	3	.....	2	1	.....	.....	11
2,280	7	2	.....	2	.....	.....	.....	11
2,160	1	.....	.....	.....	1	.....	.....	2
2,040	4	2	1	1	.....	.....	.....	8
2,000	1	2	.....	.....	1	.....	.....	4
1,800	4	5	1	8	4	1	.....	23
1,600	8	6	5	7	4	.....	.....	30
1,500	.....	4	3	2	13	.....	.....	22
1,440	2	5	4	4	12	4	.....	31
1,400	.....	1	.....	.....	.....	.....	.....	1
1,380	1	1	2	5	12	5	.....	26
1,260	1	.....	.....	.....	.....	4	1	6
1,200	20	12	9	12	23	22	.....	98
1,080	.....	1	.....	1	5	32	10	49
1,000	6	6	1	3	4	17	4	41
960	1	.....	.....	.....	.....	6	3	10
900	4	1	1	.....	1	13	56	76
Total	75	51	28	47	81	106	74	462
Average pay	$1,760	$1,518	$1,473	$1,521	$1,386	$1,045	$923	.....

Mr. McLAUGHLIN. Have you anything there to show how long these salaries have been paid; how long since an increase was made?

Mr. MARVIN. I have no statement here that would show what the increases have been, but if they have been 5 or 10 years in the service or 15 years and all they get is $1,300 they have not had much increase. The entrance salary at the present time is $900, and we have 74 men 5 years and under in the service receiving an average pay of $923 and only one receiving over $1,200 in that group.

Mr. HAWLEY. How many men will receive some increase out of this $15,000?

Mr. MARVIN. We expect to apportion this increase as justly as possible to something like 75 or 80 men, and to effect for all of them a small increase. No big increase of salary is going to be paid out of this.

Mr. CANDLER. And no increase more than $200 to any one man?

Mr. MARVIN. $200 or $240, something like that. We want to promote some of those men who have been in the service for 5, 10, 15, and 20 years who are getting a small compensation. Those men are performing a kind of work we can not find men to perform unless they get their training in the Weather Bureau. We can not go out and find men to do our work. We must take in untrained men and develop them. These men grow up in the service, and this increase is desired in order to give men long in the service, and whom we could not otherwise increase, a little additional compensation.

Mr. CANDLER. What is the total amount you are asking?

Mr. MARVIN. $15,000 is the total amount asked for for this salary increase. This is an out-and-out request, gentlemen, for an increase in the salary of those deserving men.

The CHAIRMAN. Are there any further questions on that, gentlemen? If not, take up your next item, No. 48, for official traveling expenses, $24,000. There is no increase in that estimate, but I would like you to give the committee, briefly, just how that fund is expended.

Mr. MARVIN. That fund is used, Mr. Chairman, in shifting our men from one station to another and in sending inspectors to examine stations, or in sending section directors into their districts to instruct cooperative observers, to set up river gauges, and to conduct and arrange the forces for the work in every respect. It is that necessary traveling expense to conduct the work in the field, and we have about 5,000 cooperative observers who serve without any compensation at all. They do not get a penny. We give them some publications. It is necessary for our section directors to be in close contact with them, more or less. Each director must go around in his State a little to visit those cooperative observers. Also, other men must go to the river observers, and, finally, we must have an inspection of our regular stations. Occasionally it is necessary to shift the men from one station to another. This item covers the cost of that service. There is no increase whatever.

Mr. STEELE. This item is the same as you had last year, is it?

Mr. MARVIN. The same amount.

Mr. STEELE. And the year before?

Mr. MARVIN. It is less than it was the year before.

Mr. STEELE. In this particular item I would like to know if at any time you have turned over into the Treasury any surplus at the end of the year?

Mr. MARVIN. Mr. Calvert, do you remember how much was turned in last year, approximately?

Mr. CALVERT. I think, in round numbers, there was $20,000 of the entire appropriation turned back into the Treasury, and at least $2,000 of that was involved in this travel item.

Mr. STEELE. I had the impression you had never turned any of that particular fund over; that is why I wanted to know if your thought was to use it up so that you could get another $24,000 in the next appropriation.

Mr. MARVIN. No, sir. That $24,000 represents practically what we expect will be required. Now, if we do not need to use all of that, the money goes back into the Treasury, or, with the authority of the Secretary of Agriculture, I could use $2,400 of that by transfer to some other fund for another purpose.

Mr. STEELE. You can still use that $2,000 you turned back last year, for instance?

Mr. MARVIN. No, sir; not the money that we turned back into the Treasury. We can not use that again.

Mr. HAWLEY. That is, on June 30, 1915, all surplus in every item went back into the Treasury by force of law?

Mr. MARVIN. Yes, sir.

Mr. STEELE. Then you would not necessarily send men out just to consume the balance of that fund prior to the end of the year?

Mr. MARVIN. No, sir. That is not the kind of administration we believe in.

The CHAIRMAN. In addition to that, and as another safeguard against falling into bad practices, as suggested by Mr. Steele, you have to file here with Congress each year an itemized statement as to just how you have expended your appropriation?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. That goes to the Committee on Expenditures in the Department of Agriculture, Mr. Steele, and covers an enormous volume, which I think scarcely anybody ever takes the time to read. It should be done. Mr. Anderson says he reads it.

Is there anything further on that item, gentlemen? If not, we will take up item 49.

Mr. ANDERSON. I would like to ask one question on that. There is no travel allowance in any of the other appropriations; this is the total allowance, is it?

Mr. MARVIN. That covers the total allowance for travel.

The CHAIRMAN. The next is item 49.

Mr. MARVIN. Item 49 is the Weather Bureau station at Cape Henry, Va. The little note there really explains the situation. The present building is a three-story frame structure that was put up there many years ago. It is now on the military reservation, and the War Department authorities are now preparing to utilize the site for fortifications. We must vacate the site, and we ask here for an appropriation for a building to be put up at an appropriate point on the beach.

Mr. HAWLEY. Does this $25,000 include the acquisition of the site also?

Mr. MARVIN. In this case we will have to include the site, as none is available.

Mr. HAWLEY. Does the $25,000 include that?

Mr. MARVIN. Yes, it includes that; it is for the purchase of a site and the erection of a building at Cape Henry.

Mr. WILSON. Should not that item be considered by the Committee on Public Buildings and Grounds of the House?

The CHAIRMAN. That is a mooted question. We have always carried that kind of item in this bill; although I must in fairness say that it is subject to a point of order, and a point of order has been sustained on it in the past. I have an idea that we may be able to overrule that point of order. It seems to me that it is subject to a point of order, when it will receive the ruling of the Chair.

Mr. MCLAUGHLIN. How much of this appropriation will be used for site and how much of it for the building?

Mr. MARVIN. That is not indicated in the estimate. The Secretary of Agriculture would use his discretion as to that. The amount paid for the site is not likely to be very great at that particular locality. The nature of the work to be done at Cape Henry requires that the building be located on the beach, so as to command a very complete view of the entire sea horizon. The work done at Cape Henry is sighting the approach and departure of vessels going in and out of the Cape and reporting those vessels to the central office and to the marine interests of the country. This station is also the headquarters of the seacost telegraph line, from Norfolk to Hatteras, and all the telegraphic business along the coast is conducted through this chief station.

Mr. HAWLEY. Does the Department of Commerce have any service that reports the arrival and departure of vessels in the way that your bureau does?

Mr. MARVIN. No, sir. That question has been up for consideration, and I believe it was considered that they are not authorized by law to do so.

Mr. HAWLEY. And you make the observations for them?

Mr. MARVIN. Of course, we had been doing that for many years before the Department of Commerce existed as a department. We do not report to them exactly, but we report to the marine interests; that is, the marine interests at Baltimore, Philadelphia, and other places along the coast want to have the information in regard to the arrival and departure of these vessels.

Mr. HAWLEY. Do these vessels report to you their arrival and their intended departure?

Mr. MARVIN. We sight them with a telescope, or they sometimes send up signals at night, giving their names and destinations, and we report those.

Mr. HAWLEY. Are all vessels compelled to do that or is that a voluntary service on their part?

Mr. MARVIN. If we can see them we take their names and report it. It is not compulsory; but they all desire to be reported, especially if a vessel is coming in it wants to be reported at its destination, and the dock officers prepare for its arrival and the company to whom the vessel is consigned looks after the arrival of the vessel.

Mr. MCLAUGHLIN. Have you made any inquiry in regard to the cost of the site? Have you learned who owns the land?

Mr. MARVIN. Yes, sir; we have made some inquiry there. Two thousand dollars, I think, is the approximate price that we expect to pay for the site.

Mr. CALVERT. Mr. Newsom said that it was impossible to determine what the site would cost, because it had not been thought wise to make any inquiry among the property owners, but it was his opinion that a suitable site could be obtained for about $2,000.

The CHAIRMAN. Is this amount named in the estimate about the average amount that you pay for this kind of building?

Mr. MARVIN. Yes, sir. We put up some time ago at Sandy Hook a building very similar to the one we have in mind as being needed here, and we had this amount of appropriation for that.

Mr. WILSON. Is it the custom for your department to erect buildings in this manner?

Mr. MARVIN. Not exactly a custom, I should say. We have a few buildings of our own. At places where we can not possibly get quarters we must put up buildings ourselves.

Mr. WILSON. I know; but have they been erected under the direction of the Agricultural Department or of the Treasury Department?

Mr. MARVIN. The Agricultural Department. The Secretary of Agriculture approves the plans, which are drawn up under the direction of the bureau.

Mr. WILSON (interposing). What I am trying to get at, Mr Chairman, is whether the appropriations for these buildings come

through this committee or through the Committee on Public Buildings and Grounds.

Mr. MARVIN. Through this committee.

Mr. WILSON. You have had them through this committee?

The CHAIRMAN. Yes.

Mr. MARVIN. Always through this committee; yes, sir.

Mr. STEELE. In regard to this $25,000 building that you propose, would you construct one building now, and then at a later time would you require another appropriation for tenement houses——

Mr. MARVIN (interposing). No, sir; this is for just one building, with the equipment and the necessary heating and water-supply appliances, lighting, and things of that kind. This is for only one building and the site. We must get a site, as I said, that will not be encroached upon, so that the view of the beach and seaway will not be cut off.

The CHAIRMAN. There used to be a practice in the Weather Bureau of taking some of the funds appropriated for the bureau and putting up a building without any special appropriation being made in the bill for it. Has that practice been discontinued?

Mr. MARVIN. Yes. The only buildings that have been erected for several years past have been specifically provided for, as in this case. You may remember that a building was appropriated for in Cincinnati. We spent about $25,000 there. In the first bill passed during my incumbency of the office of Chief of the Weather Bureau you made an appropriation of $3,000 for a building on the Tatoosh Island, Wash., telegraph line. That building has been erected. It is on an Indian reservation in that case, so it did not require the acquisition of a site. Those are the only buildings that have been erected in the last two or three years, and each building has been specially appropriated for.

Mr. MCLAUGHLIN. You speak of this building which was erected at Cincinnati. A Weather Bureau station was provided for Cincinnati about two or three years ago. Now, Cincinnati was not named in the law. The appropriation which permitted the establishing of stations was enlarged, and a part of the money was used for Cincinnati. Cincinnati was not named in that appropriation. You say there have been no buildings erected except by specific direction or authority in the appropriation act?

Mr. MARVIN. I think Cincinnati was named, and also Sandy Hook. Mr. Calvert may know.

Mr. CALVERT. A number of these buildings have been erected. In some instances the names of the places have been specifically set forth in the bill; in other cases merely the number of buildings to be erected has been indicated and not the actual places; but in no instance has any Weather Bureau building been erected, in a number of years, where the exact places at which the buildings were to be located were not fully discussed and named in the hearings before this committee.

The CHAIRMAN. They were either set out in the bill or discussed before the committee. I think that is a true statement of the situation.

Mr. MARVIN. Yes; I think that has been the case in recent years. The case you allude to was many years ago. Since that time every

building has been specified either in the appropriation or, at least, in the hearings.

The CHAIRMAN. Yes; I think that is correct.

Mr. MCLAUGHLIN. Well, about three years ago the appropriation for Weather Bureau stations was increased to provide for two new stations. It was understood that those two stations were to be Cincinnati and Ludington; and those stations were established. Out of that increased appropriation, was a building constructed at Cincinnati?

Mr. MARVIN. I am not sure that I can speak in regard to that appropriation. I was not in charge of the bureau at the time the appropriation was made for buildings at Cincinnati and Sandy Hook.

Mr. MCLAUGHLIN. When was the building at Cincinnati erected?

Mr. MARVIN. That was erected during 1914 and 1915; also at Sandy Hook; but the appropriation was made under the former Chief of the Weather Bureau. I was not in charge of the bureau at the time that appropriation was made. I do not know just now the exact language of the appropriation; but when I took charge of the work I put up the buildings with the positive knowledge that one of the buildings was to be at Sandy Hook and the other one at Cincinnati; and they were so erected at both places.

Mr. MCLAUGHLIN. I do not recall an appropriation that provided for the erection of a building at Cincinnati. It was understood that a station was to be placed at Cincinnati; but if a building was erected out of that appropriation at Cincinnati a different course was pursued from that pursued at Ludington, because no building was erected at Ludington. If that is true, then, pardon me, but you may have to modify your statement that no building was erected without express authority.

Mr. MARVIN. I may not have been technically correct. My statement was modified a little by saying that the location for the station was brought out in the hearings. It may not have been set forth in the language of the appropriation. But the two buildings that were appropriated for prior to my administration were erected by me, one at Sandy Hook and one at Cincinnati. Now, the station at Ludington may have been appropriated for as an additional station and not necessarily a building. Sometimes the appropriations have been made for a new station in the service, not necessarily a building.

The CHAIRMAN. I am sure that we have not set out in this bill since I have been chairman of the committee any item for the erection of a building; I do not think that has been done in the last four years. But I recall very distinctly that the Cincinnati proposition was discussed before the committee by Dr. Moore, who was chief of the bureau at the time. Are there any further questions on this item?

Mr. WILSON. I was going to say, Mr. Chairman, if that is true, is it not a little dangerous to have this item 49 in, which provides for the purchase of a site and erection of a building?

The CHAIRMAN. Personally, I should myself prefer to have the item set out in the bill so as to sustain it on a point of order rather than to have merely an increase in the appropriation and have to depend upon the records of the committee here to show where the money is to be expended. I would rather let the House have its

chance to pass upon it, so far as I am concerned; but that is a matter for the committee to determine.

Mr. STEELE. What I am trying to get at is this: You are proposing to erect a $23,000 building here. I would like to have you explain for my benefit the number of people that you expect will live at this particular place, or this house, and how many servants you will require to take care of this valuable building?

Mr. MARVIN. The official in charge, the chief operator of the seacoast telegraph line, will occupy this building, and his family will reside in a certain portion of it. The rest of the building will be used for observation work, and for this vessel-reporting service, requiring telescopes, the international signal flags for communicating with the vessels at sea, and all the other paraphernalia for the work. The staff of employees at the station will be five or six, possibly; but none of them will reside there except the officer in charge and his family. The equipment of the building is included in its cost of erection, and all the appliances, the towers, etc., for the signaling apparatus, display of flags, and the lights at night for storm warnings. It involves more than simply the erection of a building.

Mr. STEELE. Well, I notice that at some of these other places you have servants, or men at $700 or $800 a year, to take charge and work around as servants, and I was wondering if you were going to put up an expensive building here whether you would require three or four men to take care of the heating plant and such other things as it is necessary to take care of in as valuable a building as this.

Mr. MARVIN. There is nothing there in the item for the care of the building. The care of the building is comprised in the work of the messengers and the laborers that are employed on the station for other work.

Mr. STEELE. Yes; I understand.

Mr. MARVIN. And in maintaining the seacoast line. There is one repairman stationed at this point, is there not, Mr. Calvert?

Mr. CALVERT. That will probably be made clear by the statement that no article of furniture or equipment that goes into the living portions of a Weather Bureau building is furnished by the Government; and not one single Weather Bureau employee is used in the living quarters of these buildings. The expense of the service in the living portion of these buildings is taken care of absolutely by the man who occupies the quarters.

The CHAIRMAN. Is there anything further on that item, gentlemen? If not, Dr. Marvin, will you take up item 50? You have, in a measure, already explained that; but it may be well to explain it fully.

Mr. MARVIN. In our extension of the work in the Caribbean Sea, we wish to put a principal station in the Panama Canal Zone somewhere, with full equipment of instruments for making all the standard meteorological observations, and to make it a section center for the work in that whole region.

Mr. WILSON. What have you there now?

Mr. MARVIN. Nothing. All the meteorological work that has been done in the Canal Zone has been done by the engineers who built the canal and by the French before them.

Mr. McLAUGHLIN. It will not be necessary to buy a site there, will it?

Mr. MARVIN. We are not sure that it will be; but we have included the acquisition of a site in this item in case we are obliged to purchase the site.

Mr. HAWLEY. Where do you propose to locate the building—on the north or the south side of the canal?

Mr. MARVIN. It will probably be on the south; on the Panama side.

Mr. HAWLEY. The Pacific coast side?

Mr. MARVIN. The Pacific coast side; yes, sir. The exact location will be best selected by going into the region and finding the place which will give us the best results.

Mr. McLAUGHLIN. What is the state of things down there? If a building like this is erected within the Canal Zone, upon property that we consider as belonging to the United States, would it be necessary to buy the site from the United States?

The CHAIRMAN. I should not think so myself.

Mr. STEELE. I should not think so.

The CHAIRMAN. However, that is a matter we will have to consider.

Mr. McLAUGHLIN. Have you considered that, Dr. Marvin?

Mr. MARVIN. We are not thoroughly informed in regard to the exact necessities there; but we feel that we should have the authority, if the necessity arises, to procure the site on which we can erect the building.

Mr. HAWLEY. That is, you want to be able to select the place best located for your work, whether it is upon Government land or upon private land?

Mr. MARVIN. Yes, sir.

Mr. McLAUGHLIN. Would you object to a proviso being put in there something like this: "*Provided*, That no part of this money shall be used for purchasing lands"?

Mr. MARVIN. From another department of the Government?

Mr. McLAUGHLIN. No. I appreciate that you want the very best site obtainable; but it would seem to me that there is available land enough there already owned by the Government.

Mr. STEELE. What is the width of the Canal Zone? Is it 6 miles?

Mr. McLAUGHLIN. No; it is 10 miles wide.

The CHAIRMAN. We control Ancon Hill, do we not?

Mr. MARVIN. Yes, sir; I think that is within the zone.

Mr. HELGESEN. How much of this appropriation have you allowed for site and how much of it for the building?

Mr. MARVIN. We have not set forth the allotment there; and we do not know ourselves, I admit. But this whole amount in previous cases has served to give us about the kind of a building we expect to erect.

Mr. HELGESEN. You have a plan of a building such as you want, have you not?

Mr. MARVIN. Approximately, yes, sir; but we do not know just what it will cost down there in the zone; it is likely to cost more there than it would here; and we do not know to a certainty whether it will be necessary to acquire a site or not; if not, we will not do so. Take the case of the building at Sandy Hook, for instance; that

was placed on Government property; we found that we could do that there; and we did not have to spend any money for the site.

Mr. McLAUGHLIN. One reason I speak of this is that we had a bill on the floor of the House Saturday—the dam bill—providing for the use of sites within the national forests, and so on, that would pay the Government a lot of money eventually; but all the receipts were to go into the Reclamation Service; and we keep on appropriating year after year money to maintain the national forests, and then we are denied the revenues naturally arising from the forests. Now, if one branch of the service must pay for everything it gets, and another branch can use the property without paying for it, we ought to know it.

The CHAIRMAN. I think you are right about that.

Mr. MARVIN. I assure you that, if we can get the site for nothing, we will not use any of this money to pay for it.

Mr. STEELE. Then you will get along with $2,000 less?

Mr. MARVIN. Well, suppose we found that we needed that $2,000; we would be embarrassed if we did not have it.

Mr. McLAUGHLIN. It seems to me that all of those interests down there are demanding this service; they are begging you to ask Congress to establish it. Under those circumstances, they at least ought to be willing to furnish a site for the building.

Mr. HAWLEY. My understanding is that almost all of that land is privately owned. We took over the control of the Canal Zone, but we did not take over the lands of the private owners down there; and we have only certain specific lands owned by the Government down there.

Mr. WILSON. We have a strip 10 miles wide, have we not?

Mr. HAWLEY. We control that, but we do not own it all.

Mr. RUBEY. Well, I understand that they are acquiring that property for the Government just as rapidly as they can.

The CHAIRMAN. I suggest, Dr. Marvin, that you look a little more fully into the question of a site down there, and put the facts in the record for the committee's information.

Mr. MARVIN. Yes, sir; I will do so.

(The statement referred to follows:)

STATEMENT RELATIVE TO THE SITE FOR A WEATHER BUREAU STATION IN THE PANAMA CANAL ZONE.

From information obtained from the Panama Canal office in Washington it appears that, while title to much of the land in the zone is vested in the United States, there are large portions of land which are privately owned. A commission now has this matter in hand, with a view to the Government ultimately coming into possession of the privately owned property. It may possibly develop that an appropriate site for a Weather Bureau station can be obtained on land now owned by the Government, but it might develop that the best adapted site is on privately owned property. The bureau will gladly accept a suitable and appropriate site on Government-owned property if such be available. Owing to the uncertainties of the situation, authority for the purchase of a site should be included, otherwise an embarrassing condition might arise if a suitable Government site is not obtainable. This will be in conformity with the plan of legislation enacted for the erection of Weather Bureau buildings for 12 years or more. Since the fiscal year 1903, appropriations have been made for 35 Weather Bureau buildings, and in every instance, except at Mount Weather, Va.; Key West, Fla.; Sand Key, Fla.; and Neah Bay, Wash., where the buildings were to occupy the old sites, the acts provided for the purchase of sites. However, notwithstanding this authority, sites were secured without cost to the Gov-

ernment, except the nominal transfer-of-title charges, for 11 of these buildings, namely, at Birmingham, Ala.; Burlington, Vt.; Canton, N. Y.; East Lansing, Mich.; Northfield, Vt.; Oklahoma, Okla.; Peoria, Ill.; Richmond, Va.; Sandy Hook, N. J.; Yellowstone Park, Wyo.; and Springfield, Ill. Therefore, it is believed that authority to purchase a site, if necessary, should remain in the proposed act for a building in the Canal Zone, because if the money be not required it will not be used.

The CHAIRMAN. That completes your list of items, does it not?

Mr. MARVIN. Yes, sir.

The CHAIRMAN. Before you leave page 25, at the bottom of the page there is an item for maintenance, repair, and operation of a horse-drawn surrey, $375. Just what does that $375 cover? Does that include the feed of the horse, and things of that sort?

Mr. MARVIN. Yes, sir; that includes the estimated expenses incident to the maintenance of that equipment.

Mr. HAWLEY. Have you a stable on your grounds?

Mr. MARVIN. No, sir. That is for the horse and carriage and surrey, and the repair of harness, and all the incidental expenses.

The CHAIRMAN. How much does it cost you to feed a horse here in Washington?

Mr. MARVIN. I do not remember. What do we pay, Mr. Calvert?

Mr. CALVERT. We are paying $25 a month for the feed and care of the horse, including the ordinary care, such as washing, etc., of the vehicle.

Mr. LEE. Does that include blacksmithing?

Mr. CALVERT. We formerly had our own blacksmith, but not now.

Mr. HELGESEN. Is that price per horse?

Mr. CALVERT. That is per horse. We had two horses, two mail wagons, and this vehicle that is under discussion, at the stable, for which we paid $50 a month.

The CHAIRMAN. Let us get this clear. Did I understand you to say that this item of $375 includes the feed of the horse?

Mr. CALVERT. Yes; we have two horses, one of which is hired temporarily to take the place of the one that died recently. One of these horses is used for this surrey. We have two mail wagons, and all three of the vehicles and the two horses are kept in this stable, for which we pay $50 a month.

Mr. CANDLER. You drive these two horses to the mail wagons, do you?

Mr. CALVERT. One horse to the surrey and one horse to the mail wagon, but the surrey horse, as a matter of fact, alternates with the mail-wagon horse.

Mr. WILSON. Then how do you cover the yearly expense with $375, if you pay $50 a month for the feed of the horses, and so on, at the stable?

The CHAIRMAN. That is what I was trying to get at.

Mr. CALVERT. This particular item, as I understand it, is not intended to cover drayage expenses.

Mr. WILSON. I know; but this item in itself would not even pay the expense——

The CHAIRMAN. Of feeding the horses for a year.

Mr. CALVERT. $25 a month is what we figure for one horse.

Mr. WILSON. Well, that would be $600 a year for the two horses.

Mr. CALVERT. Yes; but we are not figuring two horses for this

surrey. We use one horse for the surrey and the other for the mail wagon.

Mr. WILSON. But where does the maintenance for this other horse and the mail wagon come it? Are those provided for in another item?

Mr. CALVERT. As I understand the requirement, it is not necessary to specify the mail wagon; and this item merely takes care of the passenger conveyance.

The CHAIRMAN. Please repeat that so that the record may be clear on that point.

Mr. CALVERT. This item is not intended to cover any vehicles and horses used for drayage purposes but is limited to passenger-carrying vehicles.

The CHAIRMAN. And that is put in there under the law?

Mr. CALVERT. Yes; under the law.

The CHAIRMAN. Yes; I recall it now.

Mr. RUBEY. Yes; it says in the heading to the note at the bottom of page 25, "Maintenance, repair, and operation of horse-drawn passenger-carrying vehicles."

The CHAIRMAN. Yes.

Mr. HELGESEN. Well, if you pay $300 for the care and feeding of a horse, and there is $375 in the item, and it says, "Maintenance, repair, and operation," then $75 must be simply for the maintenance and repair of the rig, horseshoeing, etc.

Mr. CALVERT. That is the situation exactly; $75 covers the average cost for repairing the vehicles and repairing the harness and for other necessary expenses.

Mr. HELGESEN. That is a tremendous cost.

Mr. CALVERT. Not when you figure it out and consider the incidental expenses in connection with it. I do not believe you would be able to find any suitable conveyance that could be operated at an average of less than $75 per annum, not including the cost of maintaining the horse, with a reasonable provision for accidents, etc.

The CHAIRMAN. What do you mean by "operation"? This is not a big proposition, still it is one of those questions that we are asked more questions about on the floor of the House than anything else. What do you mean by "operation"? Mr. Helgesen's statement is correct, it seems to me, that $75 for the repair, maintenance, and operation of a one-horse carriage is pretty heavy. You can buy a pretty fair buggy outright for $75.

Mr. CALVERT. The operation includes incidental expenses. Veterinary services are sometimes included in this; new tires, new harness, shoeing, the painting of the carriage—the carriage has to be painted every two years—all of the incidental expenses of that character are included in that $75.

Mr. WILSON. The department would not charge for veterinary services for the bureau, would it?

Mr. CALVERT. We have a department veterinarian who comes on call, if he is not engaged elsewhere, but at times it happens that the department veterinarian is not available, and in any event we have to pay for the medicine.

Mr. CANDLER. This $75 is an estimate, and, if you do not expend it, it goes back to the Treasury.

Mr. CALVERT. It must be an estimate. As a matter of fact, it would not be proper to put in this item the cost this year for painting

the carriage and charge all of it as a per annum cost, when, as a matter of fact, the painting and repair cost of $150 would last three years. Only $50 of that should properly be charged to this year, but we must have a sufficient margin to cover unforeseen expenses.

Mr. HELGESEN. Yes; but you see, you can not use any part of the money appropriated this year for next year, so that it would have to come out of this year's appropriation.

Mr. CALVERT. But it must be understood that this item is paid for under the appropriation for general maintenance of the service in Washington.

Mr. HELGESEN. I do not want to criticize you any more than the others, but there is going to be some criticism before we get this bill through, because last year, in the estimates at the back of the book, there was an immense estimate for maintenance, and some of those items were $45 or $50 for the maintenance of a farm wagon, when, as a matter of fact, you could buy such a wagon for that $45 or $50; and they had estimates of $25 or $35 for maintenance of a one-horse buggy, when you could buy a one-horse buggy for that price. This year they have brought in a very short list compared with last year, and I was wondering where the rest had disappeared.

Mr. STEELE. That was about the thought I had in mind awhile ago. I wanted to know from Dr. Marvin just how much of this fund he turns back into the Treasury every year.

Mr. MARVIN. This item of expense here is inserted in response to legislation calling for this information, and the amount is only an estimate at the best. We set down here about what we think it will cost us. That money is not an appropriation in this particular place, but the expenditure is paid out of this item 45.

The CHAIRMAN. Dr. Marvin, I think we can clarify this situation very quickly if you will tell the committee how much you have spent during the past fiscal year for the maintenance, repair, and operation of this surrey. That will give a pretty good idea of what we are doing. Of course, this proposition will not go into the bill; it is just set out in the estimates to comply with law.

Mr. MARVIN. The $25 a month, as Mr. Calvert stated, is paid for feed and care of the horse. As to the actual amount paid during the past year, I can get that and insert it in the record. I have not the figures with me.

The CHAIRMAN. All right. I wish you would put in the record just how much you have expended for the maintenance, repair, and operation of this one-horse surrey.

(The statement requested follows:)

Statement showing cost of maintenance, repair, and operation of one passenger-carrying vehicle in use by the Weather Bureau at Washington, D. C., for the fiscal year 1915.

Stabling and feeding	$300.00
Repairs to vehicle	9.25
Shoeing	10.84
Repairs to harness	3.60
Medicines	3.65
Blankets and coverings	14.00
Miscellaneous supplies and expenses	13.04
Total	354.38

Mr. STEELE. What I want to get clear is this: Suppose $40 is expended for this repairing, etc., does the balance of the amount appropriated go back to the Treasury, or do they go on and expend that full amount just because they have it?

The CHAIRMAN. No; they do not have to expend this $375, because it is not an appropriation in this bill at all. It is simply set out here in the estimate in accordance with a recent act of Congress requiring that each of the departments shall report annually to Congress just how much has been expended for the maintenance, repair, and upkeep of passenger vehicles, both motor vehicles and others. So that the best way of getting at the matter is to ask these gentlemen representing the various bureaus as we reach them to tell us just how much they have expended out of this general fund for those purposes.

Mr. STEELE. Yes.

The CHAIRMAN. And I wish the members of the committee would keep that in mind, so that we will not overlook it as we reach these other chiefs of bureaus who come before the committee.

If there is nothing else on this proposition, Dr. Marvin, would you like to make any general brief statement or summary of what you propose to do this coming year?

Mr. MARVIN. Mr. Chairman, I may say that we have set forth the increases under these four items; first, the extension of the work in the Caribbean Sea and Gulf regions; second, the extension of the work in the United States, including the forest-fire forecasts, the frost-warning service, and the river and flood work. That is just a natural growth of the service with the increasing demands of the country. The third item is the Alaskan service—the extension into that region of the climatological work, and some additional stations reporting by telegraph. Finally, there is that item of $15,000 for the salary increases for deserving men who have been from 5 to 30 years or more in the service. Briefly, that represents the several increases that we have asked for.

The CHAIRMAN. It amounts to $132,560 for the entire bureau?

Mr. MARVIN. That is the total increase, including those two buildings, of course; there is $50,000 out of that included in those buildings.

The CHAIRMAN. Yes.

Mr. MARVIN. And these increases are necessarily set forth in the different items under paragraph 47. We have added a certain amount to each of these items—for salaries, for telegraphing, and for special observations and reports—sufficient to make up the total increase.

The CHAIRMAN. I am expecting a letter, gentlemen of the committee, from the Secretary of Agriculture at almost any moment on the proposition of including in this bill an item for the study of certain volcanic activities, I presume you would call them. A gentleman named Prof. Jaggar called on me several days ago and made a very interesting statement on that subject. I understand he has also seen other Members of Congress and spoken about it. If Dr. Marvin would like to discuss the matter briefly, I think we have time to hear him this morning. Will you state to the committee, Dr. Marvin, just what is intended by this proposition, and when the

tter of the Secretary of Agriculture is received, with the permis-on of the committee, I will have it inserted in the record at this oint.

(The letter referred to was read to the committee by the clerk, nd follows:)

DEPARTMENT OF AGRICULTURE,
Washington, D. C., January 10, 1916.

Hon. A. F. LEVER, *Chairman,*
Committee on Agriculture, House of Representatives.

DEAR MR. LEVER: Referring to the question of the Government performing ertain work in volcanology, especially in the Hawaiian Islands, Alaska, Cali-ornia, the West Indies, and in the vicinity of the Canal Zone, it is desired o have included in the appropriation for the Weather Bureau an amount of money sufficent to establish this work during the fiscal year ending June 30, 1917.

This subject has been fully discussed with Dr. T. A. Jaggar, of the Massa-chusetts Institute of Technology, who is director of the Hawaiian Volcano Observatory. From informal information and advices obtained from other branches of the Government interested in these important studies, I am con-vinced that the Government should undertake this work and that the Weather Bureau, because of its extensive field organization of trained and experienced observers, is in the best position to conduct the studies with the least possible expense and the most effective results.

At first sight it may appear that the study of volcanology is not in any way connected with meteorology or agriculture. This, however, is a mistake. Some of the most fertile fields in the world are in the vicinity of great vol-canoes, as in Hawaii and, notably, around Mount Vesuvius. Moreover, from time to time volcanoes burst forth and eject tremendous quantities of finely divided dust particles, which are thrown to very great heights in the upper atmosphere. The heavier particles of dust ejected fall quickly to the earth. The volcanic activity may also be accompanied by the flow of lava and by other things that not only affect the lives of people in the vicinity but make great changes in the surface cover of the surrounding region. Recent studies have shown that the most finely divided dust particles thrown into the upper atmosphere remain suspended there for many months, and even years, before finally settling to the earth. Throughout this period the presence of this dust in the upper atmosphere materially modifies the transmission of solar radia-tion to the earth's surface and causes effects that appreciably change the climatic conditions for the time being. Only within recent years has the im-portance of the study of these phenomena of nature come to be properly and fully recognized. The prosecution of this study will add to the fund of the knowledge of the operations and processes of nature and be beneficial to man-kind in general.

It is estimated that when fully organized the work will involve an expendi-ture of approximately $25,000 per annum, but as time will be required to effectively organize the work it is estimated that if a sum of about $18,000 for these investigations is added to the appropriation for the Weather Bureau, the work can be put on a satisfactory operating basis in the beginning. The exact amount and the manner in which it should be apportioned can not be sub-mitted at this moment, owing to the absence from Washington of Dr. Jaggar, who, however, expects to return on Wednesday of this week, at which time full details for providing for this work will be prepared and submitted with-out delay.

Very truly, yours,

D. F. HOUSTON, *Secretary.*

Mr. MARVIN. To get at this matter from the beginning, I think I should say that the study of volcanic activity was first taken up four or five years ago through the agency of the Massachusetts Institute of Technology and certain people in the Hawaiian Islands interested in volcanoes there. This work has been going on for three or four years, and the desire now is to have the work taken up and carried further by the Government, in order that we may under-stand more of the processes going on in volcanic activity.

The crust of the earth, evidently, is able to put forth this molten matter and matter in other forms as a result of various forms of squeezing that are going on, perhaps. It has been found in these studies in the Hawaiian Islands that the level of the lava beds in some of the craters there that are not violently eruptive rises and falls with certain seasons of the year. They go through certain periodic changes of a definite and precise character. What is desired is to make similar observations on other volcanoes.

Mr. McLAUGHLIN. Where?

Mr. MARVIN. Some in Alaska and some in California, in the West Indies, and in the region of the Panama Canal, on the Pacific coast. Japan has already——

Mr. McLAUGHLIN (interposing). Anywhere except in our own possessions?

Mr. MARVIN. We might desire to go into some of the West Indian regions. Now, I am not prepared myself to discuss the merits of this situation. I hope an opportunity may be offered for Dr. Jaggar, who has been conducting the work, to explain it to you better than I can do.

But it is desired to have the Government undertake this work, and the question is shall the work be placed with the Geological Survey, for example, or the Smithsonian Institution; the Coast and Geodetic Survey, the Weather Bureau, or where shall it be placed? The Weather Bureau has already been authorized to conduct seismological observations, because we have an elaborate equipment of field stations already organized and manned and are in a position to do the work very economically. I think the showing I made of the collection of seismological reports, at very small expense, justifies that statement that we are in a position to do it economically.

Mr. HAWLEY. What value will be derived from the studies of volcanic activities?

Mr. MARVIN. As to the effects of those activities on agriculture, etc., if you will permit me one word I will say that the same reason that justifies the Weather Bureau doing seismological work also justifies us in doing the volcanological work, if the Government decides to take it up.

As stated in the Secretary's letter, these volcanoes eject tremendous quantities of dust and dirt and lava. The particles cover the regions around the volcano, the lava flowing over the fields, and some of the most fertile fields in the world are in the vicinity of volcanoes, like Vesuvius and elsewhere—in the Hawaiian Islands, for example. Furthermore, volcanoes that burst into eruption and throw great quantites of dust into the atmosphere produce an effect on the climate for the time being. Thus it was shown, after the eruption of a volcano on one of the Aleutian Islands (the Katmai volcano) in 1912, that great quantities of dust were thrown into the upper atmosphere which floated for many months through those upper regions. By watching the progress of that dust, as we are able to do with certain instruments, we can see the drift of the upper currents in those regions that can not be reached in any other possible way. The presence of that dust in the atmosphere intercepts the solar radiation that otherwise would reach the surface of the earth and make an appreciable change in the temperature on the

surface of the earth and possibly also in the precipitation, and possibly the volcanic dust falling into the near-by regions affects the agricultural character of the soil in the vicinity.

Very briefly, these are the considerations that justify including this work, if it is to be done, in the work that the Weather Bureau is already doing. The proposition has been made, and the Secretary of Agriculture is in favor of the idea, that if the work is to be done a small additional appropriation shall be made for the use of the Weather Bureau.

Prof. Jaggar has estimated about $25,000 for the work. In the Secretary's statement, I believe, it is indicated that as the work will not be in full operation within a year a less sum could be used—$18,000, possibly. The exact amount of this and the apportionment of it among these various items that we carry can not be given at the present time, but I think we can give it to you in the course of a few days. Prof. Jaggar is absent from the city now, but is expected to be here Wednesday, I understand.

Mr. McLAUGHLIN. How long would it take to carry on these investigations?

Mr. MARVIN. I can hardly answer that question. It is an investigation that, no doubt, should be continued for a number of years, because volcanoes are slow moving in their dispositions, and the phenomena may need to be studied for several years in order to get a definite line on them. The practical outcome of this may have a bearing on the lives of people, and perhaps——

Mr. OVERMYER. I was just going to suggest the question whether those observations would not enable you to forecast activities?

Mr. MARVIN. I have no doubt but that there will be indications of that character. Just what it will lead to I can not say at present; but we never pursue any of these lines of scientific inquiry without getting much valuable information that sooner or later we find comes to have a practical bearing on the welfare of man.

Mr. ANDERSON. Is any other country carrying on this sort of investigation?

Mr. MARVIN. Japan is one of the leaders. Vesuvius has also been studied for many years, but in a different manner, and we are just beginning to understand how these studies should be pursued.

The CHAIRMAN. Germany has been making some studies along that line also, has she not?

Mr. MARVIN. I can not say definitely as to the studies in volcanology—that is, as to this character of observation of the volcano itself—but Germany studies everything from a scientific point of view, and they are very active over there in seismological work, or at least were before the war.

The CHAIRMAN. I understood from Prof. Jaggar that Germany had done a great deal of work in this direction, but that on account of the war the work had been disrupted and discontinued.

Is there anything further you wish to say, Dr. Marvin?

Mr. MARVIN. There is just one further word in regard to this addition of the work on volcanology. The matter has come up only very recently, but I have conferred with Dr. Walcott, of the Smithsonian Institution, in regard to the matter, also with Dr. Smith, Director of the Geological Survey, and others, and they all consider

the work a desirable thing. Perhaps I am not authorized to quote them exactly, but I know they are sympathetic with the idea and think the Weather Bureau is in a position to do the work.

Mr. McLAUGHLIN. If this work is undertaken, will this be the only bureau to carry it on, or will it be taken up in some way and the work carried on in some measure by other branches of the Government, so that there will be duplication of the work?

Mr. MARVIN. I have no idea the work will be duplicated at all.

Mr. McLAUGHLIN. And can the work be done with men now in the service, or will it be necessary to employ a large number of experts and scientists?

Mr. MARVIN. This additional appropriation asked for will be necessary to carry the personnel and the whole cost of the work.

Mr. McLAUGHLIN. And that means new men?

Mr. MARVIN. It does mean new men—Dr. Jaggar, for instance. The work would not go on without Dr. Jaggar, you might say. You would have to have a volcanologist to conduct the work.

Mr. WILSON. Is he in the service now?

Mr. MARVIN. No, sir.

The CHAIRMAN. He is connected with the Massachusetts Institute of Technology, is he not?

Mr. MARVIN. He is connected with the Massachusetts Institute of Technology and is director of the Hawaiian Volcano Observatory.

The CHAIRMAN. That observatory is supported out of private funds, I understand.

Mr. MARVIN. That is a private institution. I am informed that the association in the Hawaiian Islands controlling it is ready to turn over their entire plant to the Government for our continual use if we undertake the work.

Mr. WILSON. It is the intention to employ Prof. Jaggar?

Mr. MARVIN. We would have to employ him. There is no one else who knows the subject as he knows it.

The CHAIRMAN. We are very much obliged to you, Dr. Marvin. To-morrow morning at 10 o'clock we will take up the Bureau of Animal Industry, and Dr. Melvin will appear before the committee.

(Thereupon, at 12.05 p. m., the committee went into recess till Tuesday, January 11, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Tuesday, January 18, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

[After other business trans

The CHAIRMAN. Gentlemer
in reference to volcanic wo
through the Weather Bureau

**STATEMENT OF PROF. T.
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Prof. JAGGAR. I am passi
report of the committee of t
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to you.

(The report referred to fol

HAWAIIAN VOLCANO RESEARCH ASSOCIATION.

REPORT OF COMMITTEE APPOINTED TO CONSIDER METHOD OF MAKING THE HAWAIIAN VOLCANO OBSERVATORY A GOVERNMENT INSTITUTION.

[Adopted and recommendations approved to go into effect July 17, 1915, by the board of directors, Hawaiian Volcano Research Association. By them transmitted for indorsement and publication to the Honolulu Chamber of Commerce with recommendation to that body that the Hawaiian National Park bill be pressed at the same time.]

PART I.

PROPOSED UNITED STATES BUREAU OF VOLCANO OBSERVATORIES.

History of Hawaiian Volcano Observatory.—The Hawaiian Volcano Observatory was first planned in 1909 by subscribers in Honolulu at the suggestion of Prof. T. A. Jaggar, of the Massachusetts Institute of Technology. In 1911 the Massachusetts Institute of Technology sent an expedition to Kilauea volcano headed by Mr. F. A. Perret, and scientific studies at the crater were inaugurated. In 1912 an observatory building was presented by the town of Hilo, and systematic records of volcano and earthquake activity have been maintained since that time under the direction of Dr. Jaggar. Funds were furnished by the Massachusetts Institute of Technology and subscribers in Hawaii. In December, 1913, the committee in charge of the Hawaiian funds organized the Hawaiian Volcano Research Association and adopted a constitution as a voluntary association (a) to promote investigation of volcanoes, (b) to maintain an Hawaiian observatory, (c) to invite scientific visitors to Hawaii and (d) to publish reports and make collections. The present function of the Hawaiian Volcano Observatory is to serve as a laboratory at Kilauea volcano for preservation of records and assistance of scientific visitors, under the Hawaiian Volcano Research Association, to which society the Massachusetts Institute of Technology is subscriber and contractor for the volcanologic recording. This recording is being done by Mr. Jaggar, assisted by Mr. H. O. Wood, as seismologist. Mr. Jaggar retains his professorship in the Massachusetts Institute of Technology on leave of absence for purposes of research for five years from July 1, 1912. His salary during this term is paid by the Hawaiian Volcano Research Association.

At the present time, in 1915, records have been made of the activities of Mauna Loa and Kilauea volcanoes in Hawaii for three and a half years, and during this time a record of weather and earthquakes has been maintained. Special studies of the resident staff have concerned the mechanism of the phenomena evidenced by the rise and fall of the lava columns in the pit between the two adjacent volcanoes, and the relationships of the local earthquakes to the volcanic activities. Specialists from the United States Geological Survey, United States Coast and Geodetic Survey, and the Carnegie Institution of Washington have made topographic maps, magnetic surveys, and analyses of volcanic gas as scientific visitors. Other persons on scientific missions from many lands have been here from time to time.

FUTURE REQUIREMENTS OF THE HAWAIIAN VOLCANO OBSERVATORY.

The net result of the first four years of work at these most active volcanoes in the world is a demonstration that the project is of far reaching value, provided two essentials are preserved, namely permanency of record and hospitable encouragement of the work of scientific visitors.

Permanency of record means the construction of fireproof buildings and disaster-*proof* vaults for the archives of the observatory, and either endowment or Government support which will maintain for all time a system of noting, measuring and recording the changes of activity in the lavas and gases of the volcanoes, and the quality and quantity of the qualings and tiltings of the ground.

Hospitable encouragement of scientific visitors means much more than appears at first sight. This function of the observatory is not a mere amiable side issue, but a first essential. The reason for this is that no resident staff can ever be large enough to inaugurate all the experimental work that the new science of volcanology demands for its healthy growth. Hawaiian volcanoes attract the attention of geologists, astronomers, meterologists, chemists, and physicists as a field laboratory which they are anxious to experiment upon. Their results add to the store of material essential for the improvement, from time to time, of the recording done by the resident staff. By the simple device of hospitable encouragement, meaning provision of some laboratory facilities and occasional correspondence urging the visits of certain specialists, we may succeed in securing scientific data at the hands of the most skilled experts which will make for the prime object of our association: namely, the promotion and improvement of volcano investigation. This principle has been adopted in other research establishments, such as the zoological experiment stations and the astrophysical observatories, with marked success.

OBJECTS OF A UNITED STATES BUREAU OF VOLCANO OBSERVATORIES.

Whatever private endowment might do for the immediate purposes of the Hawaiian station, there is no question but that scientific intervention in volcanology by the United States Government, having in view permanent observatories at widely distributed active volcanic vents around the Pacific, and within the American domain, would be much more far-reaching. At first mention, such work would seem too specialized and technical to deserve a bureau by itself, and the question might be asked, "Why is not this within the province of the Government Geological Survey?"

In answer to this question, two points covering volcano study must be strongly insisted upon and emphasized even at the risk of repetition. The first is that volcano recording is no more geology than it is economics or meteorology. It is in a measure all of these, but it no more concerns fossils, coal, and iron, and the history of the earth, than it does the origin of the gases and dusts of the atmosphere or the vital needs of mankind when a time of frightful earthquake or lava disaster is approaching. The geologist maps the distribution of ancient deposits on the land and interprets the past history of the rocks. The volcano observatory maps the changes from day to day at a volcanic vent with a view to interpreting the probable changes of the future for the benefit of science and of mankind. The geologist is vitally interested in the products of volcano recording, for only by this means can he learn to understand the lavas and ore deposits of the ancient volcanic land. But the training and equipment of geological surveyors is all for the study of ancient history and not to maintain observatories of present-day happenings. The second point is that volcano recording has an eventual humane and commercial bearing quite remote from economic geology. The terrible disasters of the twentieth century due to earthquake and volcanic eruption are fresh in the public mind and need no recounting here. Volcanoes are critical centers of such disaster and in the science of the globe are physically related to earthquake. The records of volcano observing stations, when such have been estab-

hed a few score years. will as vitally improve conditions of life and engineering nstruction in eart e lands as the Government weather service has improved iculture, and, cou ..u with magnetism and astronomy, has removed the terrors navigation. These two points, then, distinguish volcano observing from geology: involves perpetual recording at permanent stations like astronomy or meteorology, d it concerns the present and the future of the dwelling places of men.

The specific objects of a Government volcano service in the United States would more closely related to the work of the United States Coast and Geodetic Survey d that of the Weather Bureau than to that of any other Government offices. In ler to keep record of distributed centers of emission of gases and lava from the earth, d to compare these records with each other and with earthquake reports as col-:ted by the Weather Bureau, the United States should maintain volcano observa-ries in Hawaii, the Philippines, Aleutian Islands, Alaska mainland, California, d Nicaragua. It would be advisable also, by cooperation or otherwise, to maintain observatory in Mexico and if possible, from Guam as a center, in the Ladrone lands. It is obvious to anyone who has given close attention on the one hand to lcano science and on the other to the present organization of scientific bureaus in ashington that there is no one Government bureau at present especially adapted take under its wing a division of volcano observatories. Volcanology is peculiar that its stations would, many of them, be on islands in the ocean and so would quire visitation with the aid of ships, such as those of the Coast Survey, Coast Guard, avy, or Army transport service. So far as connection with seismology is concerned, th the Coast Survey and Weather Bureau now maintain earthquake recording ations. The Weather Bureau, with its meteorological observers and instruments attered from Porto Rico to the Philippines, and now empowered by Congress to udy earthquakes, is in many respects better suited for affiliation with a division of lcano observatories than any other Government agency. The connection, more-er, between volcanoes and the study of the atmosphere is very close, for Prof. cAdie has recently drawn attention to the effect of volcanic dust on climate, and cent studies of volcanoes have accentuated the importance of gas; all active vol-noes are continually, in some degree, adding to and changing the composition of e air.

CONTRAST BETWEEN VOLCANOLOGY AND SEISMOLOGY.

As the layman is very apt to confuse the study of volcanoes with the study of earth-akes, a word should be said defining the distinct purpose of the volcano observa-ries proposed. A few years ago the Geological Society of America issued an appeal ging upon Governments the establishment of volcano and earthquake observatories. Partly as a result of this, Congress has approved earthquake study by the Weather ureau. A seismological observatory maintains delicate pendulums which write ıtomatically, year in and year out, with pens actuated by the pulsations of the ound, a story of earthquakes far and near. Earthquake science is a branch of earth ıysics. The records are compiled and published by an international committee ıving headquarters at Strassburg, Germany. There are already many public and ivate earthquake recording stations. A strong earthquake sends out waves through e globe which write their records wherever these delicate pendulums are set up. he study of these records of world-shaking earthquakes gives information to a phys-ist about the physical condition of the inside of the globe. Again, many districts ıve small local earthquakes not strong enough to permeate the world, so to speak, ıd these also are recorded on local seismographs and are chiefly of interest in con-ıction with local engineering and geology, or local volcanoes, or as the aftermath of me great earthquake. Earthquakes, destructive or otherwise, may occur anywhere, ıd there have been disastrous ones in eastern Canada, the Mississippi Valley, in ıuth Carolina, California, Alaska, Hawaii, the Philippines, and some other places thin the territory of the United States. All of this interests the science of seismology. In contrast to this science, the study of volcanoes, or volcanology, is concerned with e quality and quantity of active vents in the crust of the earth which occasionally continuously emit gas, lava dust, and liquid lava. Such a place is an active vol-no and there are about 425 of them known in the world. They are largely in or ar the great oceans, but some. like Lassens Peak in California, are, exceptionally, ite a distance inland. Small earthquakes invariably occur in the vicinity of tive volcanoes and sometimes great ones; it is perhaps this fact which leads so many ople to associate volcanoes with the idea of earthquakes. As a matter of fact, how-er, many of the greatest earthquakes have been nowhere near living volcanoes as, example, the Charleston earthquake of 1886 or the San Francisco earthquake of 06. The only volcano observatories in the world are those on Vesuvius and Etna

in Italy, Kilauea in Hawaii, Asama in Japan, and Taal in the Philippines. And these are not all of them commonly counted in existence. The oldest of them is the Royal Vesuvian Observatory, which was founded about 50 years ago. There has never been any concerted action which governs among these observatories and their publications have not been conservative or uniform. It is the object of the Hawaiian Volcano Observatory and its Hawaiian Volcano Research Association to reform volcano observing in its respect, if possible, and to spread a propaganda of union and orderly observing. The observations summarized and issued at stated intervals. It should be clear from the explanation that the task of a volcano observatory which accumulates all the observations, old and new maps and measurements of existing craters, all rocks, temperatures, gas emissions, and the relation of all these to the seismicities can be weather, a quite distinct from an earthquake laboratory which may be taken anywhere in the globe and takes account only of the movements of earthquakes. It can observe from day to day the rise and fall, from day to day of the volcanic activity in the last few years at Colima, Mexico, Lassens Peak, California, Katmai, Alaska, Mount Pelee, Martinique, Paramos near Quito, to compare with what we have observed in the crater of Kilauea in Hawaii during the same period, we could notably add to our knowledge of the [illegible] and the efforts of these squeezings on volcanoes. We have proved, at Kilauea, little that some things about volcanic eruption are [illegible] in almost every volcano than there are certain key volcanoes like Stromboli or Kilauea, which are continuously active in some sense so that there always exists [illegible].

REASONS FOR [illegible] OBSERVATORIES.

Enough has been said to indicate the success of scientific observation of volcanoes. Persons not trained in geology are apt to think of volcanoes as places dormant most of the time and dangerously explosive at long intervals. This is true of some volcanoes, but even at these places in the minor periods there are hot sulphurous gases and waters oozing out of cracks called solfataras, and these would show changing composition and temperature and, in addition, underground noises and measureable tiltings and tremblings of the ground would vary from day to day and be worthy of measurement and record. The slowest growing of these things increased in vehemence during the months preceding an eruption. But, as stated above, it is not necessary to select a violently steaming volcano for the location of an observatory, as there may generally be found in every volcanic region such as the Philippines, the Japanese mainland, the Lucrine Islands, or the Caucasus or Hawaii one or more vents perpetually active and perpetually changing. Near these places the observatories should be located, each observatory keeping within its sphere of influence a watchful eye upon the greater neighboring volcanoes with the aid of voluntary observers and such means of communication and transportation as are available.

It is just because of the intermittent and long interval phases of great volcanic eruptions, and because of the time element in the nearing in prediction and change, that permanency and stability of method are needed in volcanic study. Just as the physician uses the microscope to subdivide tissues into their ultimate units, so the student of the great changes in the universe must devise an apparatus for subdividing the events which happen in time into their smaller component parts. An observatory, whether it be recording the motions of the stars, the changes of the weather or the fluctuations of the ground, is a time microscope, and it is the duty of science, in view of the short-lived limitations of the individual observer, to create institutions which will live through the centuries and observe the process as a whole with the aid of the minute records which a succession of observers accumulates. Great generalizations, like Darwin's statement of evolution, have only come about as the result of the patient labors of many investigators who classified and catalogued species.

In volcanology, as, for instance, with the workers at the Hawaiian Observatory, it has been found continually necessary to hark back to the meager accounts of many casual observers who wrote notes on the volcanoes during the last century. It is most baffling and frequently disheartening when one is working on the question of the periods of recurrence of eruption in a volcano like Mauna Loa to find whole years of the past history utterly unrecorded and to be able to get no information about an earlier than 100 years ago, a time when Kilauea exploded and produced [illegible] eruptions. There is no information extant on the conditions of the crater during the 50 years after Capt. Cook discovered the Hawaiian Islands. Such a huge volcanic eruption will occur again after an interval of 150 or 200 or 300 years, and such long intervals [illegible] are by no means uncommon with either volcanoes or earthquakes. [illegible] It is that permanent institutions are needed, just as in astronomy, which

shall faithfully preserve measurements and charts to serve the future generations and make continuously for the advancement of science.

Palmieri, founder and first director of the Royal Vesuvian Observatory, deserves all honor and credit for being the first to point out clearly the necessity for regular secular recording of the activity of volcanoes. And the Italian Government has the honor of being the first to put this idea into effect. Even to-day there are geologists who consider consecutive routine study of the earth's interior through volcanic vents as unnecessary and hopeless, and whose sole interest in volcanoes is to send expeditions thither when unusual eruptions occur. These expeditions commonly arrive on the scene after the eruption is all over, and precise or instrumental record of what led up to and accompanied the crisis is generally wanting. A so-called eruption of a volcano is merely a paroxysmal phase of the escape of gas from inside the earth, which is going on there all the time. Surely, then, it is the duty of science to attach its measuring instruments to the gas vent, a marvelous place, the orifice of a shaft leading down scores of miles into the hot globe, and learn its secrets. The volcano observatory has this great advantage over the earthquake observatory, viz, its location is defined in the economy of the globe as one of the relatively few deep holes which have been there from time immemorial and which unquestionably yield evidence of change when a great change is approaching. Even from what little we know about the science to-day, there is no doubt whatever but that great volcanic eruptions are predictable; the location is assured and premonitory symptoms occur. In earthquake science there is no such assurance with respect to either place or time. Moreover, if seismology is to arrive at possibilities of prediction, perhaps the most hopeful line of investigation to follow in starting on the quest will be to begin with the study of volcanoes and find out definitely how they are related to the strong earthquakes which sometimes happen in their vicinity. The Messina earthquake was an illustration in point, possibly predictable if science had really understood all the workings of Mount Aetna.

NUMBER OF VOLCANOES IN UNITED STATES TERRITORY.

The United States probably possesses more than a quarter of the active volcanoes on the globe. The catalogue of the late G. Mercalli made the total number of volcanoes in the world about 417, and of these on American soil there are about 60 in Alaska and the Aleutian Islands, and probably as many more in the Philippines, Hawaii, and western United States. We have then over 100 active volcanoes and our affiliation with Nicaragua and possession of the canal route through that republic, as well as our interest in Central America because of the Panama Canal, would justify a scientific bureau of the United States Government in extending its operations to the Nicaraguan volcanoes.

NUMBER AND LOCATION OF PROPOSED AMERICAN OBSERVATORIES.

For a beginning the observatories should be placed so as to secure as much as possible the same sort of advantages as is possessed by the Hawaiian Volcano Observatory, namely, (1) continuous measurable volcanic activity, (2) facilities of transportation and communication for subordinate stations and general observations at other volcanoes, and (3) proximity to a center of civilization. The third requirement obviously can not always be satisfied, as some of the most interesting and important volcanic vents are remote from civilization. In case of such remoteness, the station ought to be equipped with a large power boat or other means of transportation so as to keep reasonably in touch with a base of supplies.

In the western United States there are two places of great importance for experiment and measurement in volcanology; namely, Lassen's Peak in California and the geyser district of Yellowstone Park. These are both scenes of very ancient expiring volcanic activity, the Yellowstone the most so.

An observatory in Nicaragua, even close to the capital, Managua, would cover the activities of several volcanoes typical of the volcanism of Central America and of greater intensity than that of Lassen's Peak. The isthmian vicinity is of great interest also because of the relationship of severe earthquakes to decadent volcanoes, as in the cases of the Quetzaltenango earthquake of 1902 and the Costa Rican earthquake of 1910—the latter right in the line of the Nicaraguan volcanoes, where experts earlier employed by the Nicaragua Canal Commission believed earthquake conditions relatively harmless. The great Cartage earthquake of 1910 conclusively demonstrated the wisdom of the choice of the Panama route.

In Alaska there should be one observatory near Unalaska village, covering the activities of Akutan and Bogoslof Volcanoes, and provided with a strong power boat. Akutan is well known to navigators but is unknown to science, and like Stromboli is continuously active; it should prove a most valuable index volcano for the Aleutian

chain. Another observatory should be placed on the Alaskan peninsula near whatever volcano is there most steadily active and convenient to a base. It will require a reconnoissance to choose the most favorable site. This Alaskan volcano line is of intense interest to science, for it is a place of transitions from volcanoes under the sea to volcanoes elevated above the sea on the backbone of a continent, and the whole process of volcanic eruption in conjunction with upheaval and earthquakes is probably as rapid on the Alaskan peninsula as anywhere in the world.

In the Philippines there is a small observatory which has been erected by the insular government near Taal Volcano as a precautionary measure since the terrible disaster of 1911, when some 2,000 people lost their lives in the rush of dust and gas from a sudden explosion of the crater. Taal has the advantage of being relatively near Manila but whether it is the most suitable place for a permanent observatory in the Philippines is not known to your committee. There are many other active volcanoes in the archipelago.

In the Ladrone chain of islands, which extends southward from the Bonin Isles of Japan, there are active volcanoes, some of them perennially emitting clouds of gas and dust, and this chain is particularly interesting as representing the greatest circle of active volcanoes in the world, known as the Sunda Arc. This arc begins on the west with the Andaman Islands and extends in a circle through Java and Sumatra, the Moluccas and the Ladrone Islands to the Bonin Islands and Japan. The Philippines lie in the center of this circle. The Ladrones would thus offer a type of volcanism representative of one of the great primitive features of the globe and of a large oceanic area outside of the territory of the United States. The volcanic activity there should be closely akin to that of the Aleutian Islands, but at present there is almost no information about it. The establishment of an observatory in this chain might be expensive owing to the remoteness of the station, but would not fail to be of interest. The active volcano Farallon de Pajardos is well known to navigators and is generally passed by the Army transports going to and from Manila. It is said to be always "smoking," and from the photographs which have been taken of it, it has every appearance of being similar to Akutan and a good subject for study if there is any other island less formidable as a dwelling place, which may be used as a base.

Lastly, coming to the island of Hawaii, we have there to do with the two most active volcanoes on earth, Kilauea and Mauna Loa, and being in the middle of the North Pacific close to Honolulu, which is on steamer routes in all directions, the place possesses a strategic value from the scientific standpoint which is unsurpassed. If the United States Government is to take up the work which the Hawaiian Volcano Observatory has started, and extend it to the other Pacific lands which that government owns or controls, it could find no better place for a headquarters of a bureau of volcano observations than Honolulu. The Hawaiian Volcano Observatory would then become the main central volcano experiment station, and there is much about the Hawaiian volcanoes which justifies their selection for this purpose. The central administration of an American volcano observatory service at Honolulu would have the advantage of being in touch by steamer and cable or wireless with Panama, Tehuantepec, California, Seattle, Vancouver, Japan, Guam, the Philippines, Samoa, Fiji, and New Zealand. There is certainly no American community so sympathetic with the aims which such a Federal bureau would have as the business men of Honolulu who have given evidence of this sympathy by their liberal subscription to the funds of the Hawaiian Volcano Research Association.

PRESENT STATUS OF VOLCANO STUDY IN THE PACIFIC

The following is a brief review of what has been done in the last few years in Government study of Pacific and Cordilleran volcanoes.

Japan in 1891 after the serious earthquake of that year appointed and financed a committee of seismologists and engineers to study what could be done to prevent disaster from earthquakes. This committee has existed ever since and has published many memoirs in English as well as in Japanese. Part of their work has dealt with the study of the active volcanoes of Japan and they have given increasing attention to the study of volcanoes in the last few years. Small seismological observatories have been placed on or near several active cones and Dr. Omori, chief of the committee, has recently given close attention to the Asama volcano and published several memoirs as a result of his studies there. An especially noteworthy feature of the Japanese administration of such a scientific work is the economical cooperation which exists between the several government bureaus concerned and between all of these and the Imperial University of Tokyo. Dr. Omori is professor in the university, his chair [illegible] and he has at his service all the stations of the Central Meteorological Observatory, which corresponds to our Weather Bureau. The efficiency of

the Earthquake Investigation Committee of Japan in volcanology was well shown when Sakurajima erupted in 1914. Hardly any lives were lost and at least 90,000 people were temporarily deported and returned to their homes in safety under competent scientific advice.

The Bureau of Science in the Philippines maintains an observatory of meteorology and seismology in Manila administered by the Jesuit fathers, and these men have done most valuable work in compiling what is known of the Philippine volcanoes and observing Taal volcano.

The United States Geological Survey has mapped the geology of Yellowstone Park, encouraged physical studies of the geyser activities there, and very lately, in conjunction with the Forestry Service, has caused a watch to be kept on the activity of Lassen's Peak in California. The Geological Survey has also published some catalogues of earthquakes and geological papers dealing with the Hawaiian volcanoes.

The United States Weather Bureau has for many years operated a seismograph in Washington, and lately the bureau has been empowered to extend its seismological work.

The United States Coast and Geodetic Survey has for many years maintained certain observatories for the study of earth magnetism, and some of these places have been equipped with seismographs. There is such an observatory near Honolulu, and in 1913 the Coast Survey made special magnetic observations at the craters of Kilauea and Mauna Loa. Formerly also this bureau made determinations of terrestrial gravity in the Hawaiian Islands.

The United States Revenue-Cutter Service (Coast Guard) at the request of the National Geographic Society has done some work in visiting and reporting upon active volcanoes in the Aleutian Islands.

The following Government agencies have from time to time, by loan of instruments or otherwise, assisted the Hawaiian Volcano Observatory: United States Geological Survey, Hawaiian Territorial government, United States Weather Bureau, College of Hawaii, United States Army, and the United States Coast and Geodetic Survey.

FUTURE OF THE HAWAIIAN VOLCANO RESEARCH ASSOCIATION.

It should not be understood that the Hawaiian Volcano Research Association will go out of existence in case the observatory be taken over by the Federal Government. The maintenance of an observatory is only one of the four objects of the association. The other three are to promote volcano investigation all over the world, to invite scientific visitors to study the volcanoes of Hawaii, and to produce publications and make collections in volcanology. If the association succeeds in inducing the Government to maintain the observatory and to build others in other places, it will have abundantly succeeded in its first two objects. The association can then devote its energies to building up a museum of volcanology which will be a center for scientific visitors, will accumulate a great library of volcanology, and will continue to publish the reports of those special workers of the association who may continue to take aggressive interest in scientific problems connected with the volcanoes of Hawaii.

PART II.

PROPOSED METHOD OF BRINGING VOLCANO OBSERVATORY BILL BEFORE CONGRESS.

Delegation to Washington.—The foregoing part of this report makes it clear that no other Government has greater reason to take scientific interest for humane, practical, and theoretical ends in observing systematically the volcanoes of the Pacific than the United States. Scientific societies and academies in Europe, America, and the Orient have earnestly recommended that Governments take up this work. The recent visit to Hawaii of a large delegation of Senators and Congressmen in 1915 makes this a favorable time to present the matter to the American Government in the form of a bill creating a bureau of volcano observatories. Many of the Senators and Representatives expressed themselves as favorable to the project of having the Federal Government take over the Hawaiian Volcano Observatory and perhaps extend the work to other volcanoes in the Federal domain. The director of the Hawaiian Volcano Observatory was urged by some of these gentlemen to bring the matter before Congress, and it is with this in view that this report is presented. It will require advice which can only be obtained in Washington to determine what department or existing bureau of the Government can best further the interests of volcano research, and therefore the actual drafting of a bill should be done in Washington. Your committee would recommend that the Hawaiian Volcano Research Association send Prof. Jaggar as its delegate to Washington in November, 1915, provided conditions at the

Nat[illegible] a suitable bill dra[illegible]

[illegible] be prepared by the committee should be instructed to consult with the [illegible] which have been in any way concerned [illegible] He should also [illegible] pursued [illegible] bill [illegible] to secure the [illegible] so that whatever [illegible] and thus develop into [illegible] especially as bearing [illegible]

[illegible] —Your committee would recommend that the Secretary of the Smithsonian Institution go on record as favoring [illegible] the Massachusetts Institute of Technology, the conveyance [illegible] to the United States [illegible] Volcano Observatories [illegible]

Your committee [illegible] in conveying the observatory [illegible] should further go on record as [illegible] the conduct of the observa[illegible] part of this report, namely [illegible] shall be systematically published [illegible] inviting skilled scientific visitors [illegible] is a sound policy and results at the [illegible] favorable development [illegible]

[illegible] A. THELSTON,
[illegible] WESTERVELT,
[illegible] JAGAR,
[illegible] Committee.

Prof. JAGAR. For [illegible] undertaken under the direction of the Mass[illegible] of Technology at the active volcano of Kilauea [illegible] Hawaii. During that time, we have been a voluntary station of the Weather Bureau and we have carried on a systematic seismological [illegible] investigation of the activities of Kilauea, the most active volcano in the world, which belongs to the United States. There are three active volcanoes in Hawaii, and we are incidentally watching the other two.

At first sight, it might seem strange that the question of the study of the activities of volcanoes should come before the Department of Agriculture, but I think we can make it clear in a very few words how this comes about. The Weather Bureau has long been under the Department of Agriculture, and the meteorological services of the world have been used for the purpose of studying earthquakes and active volcanoes, because they were the places that were concerned with the agricultural populations that have been so frightfully devastated by those cataclysms in the last 15 years. There has been about $3,000,000,000, worth of property destroyed by eruptions and earthquakes since the year 1902. A gentleman from San Francisco told me that a conservative estimate of the loss there from fire and earthquake was in the neighborhood of a thousand millions in property, and there have been somewhere between three and four hundred thousand lives lost. The St. Pierre disaster, at Martinique in 1902, wiped out 30,000 people, and the Messina earthquake carried [illegible] at least. There have been many scientists of this country, and of other lands who have studied the problem since that time, trying to find methods of saving life and property from those terrible catastrophes. We must not forget that we had a terrific earthquake [illegible] at home in 1886, at Charleston, S. C.

Japan has led the world as a nation in attacking this problem so s to be prepared to forewarn and so as to handle the engineering nd of it. It was on this account that an engineering school, the lassachusetts Institute of Technology, took up this question. You ll know the Massachusetts Institute of Technology does not concern self greatly with questions of purely theoretical research, but rather ith questions of practical science. We are there training young en to be practical engineers in every line. One reason why they ent me to Hawaii five years ago was that this subject is a vital one hat concerns the building of viaducts, dams, and great engineering rojects and reclamation projects in those places where fault lines or oving rifts of the earth may, by sudden activity, tear to pieces nything on the line. And we have hundreds, and probably thouands, of fault lines in territory now belonging to the United States.

Active volcanoes are places for experimentation on this subject, because there are many local earthquakes in the vicinity of volcanoes, and a volcano is a live safety valve—one of the windows of the globe. They are great holes that go down 40 and 60 miles into the crust of the earth, from which gases are continuously being carried up and added to the atmosphere, and around them much shaking is going on. A volcano is thus an ideal laboratory for working out how the earth shakes in relation to the escaping of the gases and whatever molten matter may be carried with them. The volcano is probably primarily the cause of the trouble; and in how far earthquakes exist wholly independent of recent or ancient volcanoes is a very profound question. We do not know. We do know that quakes are frequent in certain sections of this country.

A word about the work of the Japanese earthquake investigation committee. This began in 1892, when they had the Chinese war on their hands and were tremendously in debt. Nevertheless, they appropriated about $15,000 to establish "a committee for the study of prevention of diasaster by earthquakes;" this phrasing giving the Japanese men of science a free hand to study anything that would bear on that question, and they studied seismology, engineering, geology, and magnetism. They began with the study of magnetism, because they thought from the magnetic changes in a given place they were going to learn how to predict earthquakes, and they worked at that for some years learning much about the magnetic changes in Japan; but they did not learn how to predict earthquakes.

Then, turning their attention to the more active volcanoes, of which they have 55 or 60 in Japan, they began to get positive results; so that during the last five years Dr. Omori, who is at the head of the earthquake investigation committee of Japan, working in conjunction with the Japanese Weather Bureau, has been giving very close attention to Japanese volcanoes.

To give you one illustration of the great results of this thing to the people there, I was delegated last year to go over to Sakurajima, the tremendous volcano that broke out in Japan in 1914. In actual size, that volcano is very much like Vesuvius. The efficiency of the earthquake investigation committee of Japan was well shown. Hardly any lives were lost, and at least 90,000 people were temporarily deported and returned to their homes in safety under competent scientific advice. This is strongly in contrast with the eruption of St. Pierre at Martinique in 1902, when 26,000 people were wiped

out in the city in a few minutes. Many people fled and four months afterwards, after the people were sent back to their homes by the authorities, 2,000 more were killed, in the face of warnings of some of our American scientists who had been there, and who insisted that they should not be sent back. In Japan the populace moved after about two days of continuous earthquakes they went across the country and crowded in the outlying towns, with almost no suffering, although in the dead of winter. On the first day, from 30 to 40 people were killed in Kagoshima by an extra strong earthquake, which happened in conjunction with the eruption. This was the only serious loss of life. Prof. Omori came and looked over the situation, and issued a proclamation that the greatest danger was past, as lava had begun to flow from the volcano. The whole 90,000 people came back to Kagoshima, within 2 miles of the volcano, and nothing further happened. The result of that tremendous eruption was the loss of from 40 to 50 lives, in contrast to 30,000 lives lost at Martinique 2 years before.

So it seems to me we have made some progress. It was along this general line of study that I was sent out to Hawaii. We have developed, through private support—from business men—a small observatory. It is a light frame building with some outbuildings, the main feature being a cellar underneath the building that contains four fairly modern instruments for recording the tiltings and trembings of the ground. In addition, daily observations are made at the active crater, which is 3 miles away.

To make a long story short in regard to the results we have obtained there, I want merely to show you this diagram, which illustrates the actual results of four years' study of the rise and fall of the lava at Kilauea, and this will give you some notion of why we want to extend this work to places like Lassens Peak, that has recently broken out as an active volcano in northern California, and one or two volcanoes in Alaska and in the Philippines.

You see here a series of black lines that represent the actual height of that column of lava which, from month to month, rises and falls over a range of 600 feet and more.

The measurements have been made with a transit on the edge of the crater looking down at the boiling, seething lake of lava of Kilauea, that the congressional delegation saw so well out in Hawaii last summer. These columns represent January, February, March, and so on, to December, 1912. In January, you have a high level of the lava; in March it has fallen off 300 feet; a high level again appears in the summer; again it has fallen off in the fall, and here [exhibiting diagram] you have a high level again in the winter. This sequence, in brief, has gone on during the years that we have been watching—high in the winter, low in the spring; high in the summer, and low in the fall.

Now, this is a discovery that has never been known before. The lava rises at the solstice, is low at the equinox, high at the solstice again, and low at the equinox. There is a similar occurrence monthly, which corresponds to the lunar tides, and the general meaning of this appears to be that there is a squeeze going through the crust of the earth with the movements of the sun and moon, north and south, which is definitely compressing the mass of lava foam and causing it to rise and fall in the cracks of the globe. In general, we can count

in advance on these movements and use them as a basis for prediction. Through a certain long term there will be a downward movement, and through another term of five or six years there will be an upward movement. And then we have also found a daily tide, but we have never had money enough to measure it through a lunar month so as to determine whether or not this has a period like the oceanic tides. But we do know that we get a high level in the lava at the times of maximum air pressure every day, which is about 11 o'clock in the morning and 11 o'clock at night in Hawaii. We need more precise work, studying the thing with observations about once in every 15 minutes through a lunar month, and this would require at least four men capable of using the transit and working in shifts.

This [exhibiting chart] will give you some idea of how we have attempted predictions. We have been systematically predicting during the last two years what was going to happen, and in a number of cases we have succeeded rather remarkably well, simply basing the expectation on this curve, although we have nothing like enough data to come to any conclusions. But after a few more years we shall have something very definite.

Now, with regard to the extension of this work. We have been doing this work on something like seven or eight thousand dollars per annum, salaries included. Most of that has been put up by a group of business men in the Hawaiian Volcano Research Association, in Honolulu. The Massachusetts Institute of Technology has had a small fund to use for the purpose and has acted as contractor for the scientific work. The object of the work was to get started, and then to keep going by getting an endowment in any way we could. It might be done by the Carnegie Institution or some other large concern of that kind, or by the Government. But, as these photographs and diagrams show, the problem needs consecutive work for many years to come, and it seems that the Government is the proper agent to do it. Why? Because the United States Government to-day owns more active volcanoes than any nation in the world. The nations of Europe have been engaged in war, and their seismological and volcanological research has been disrupted. There are 60 volcanoes in Alaska and many more in the Philippines. We have the whole Pacific coast of the United States, containing many recent volcanoes. We have reason to be interested in the earthquakes and volcano country of Central America. The Panama Canal Zone happens to be the least seismic part, but there are many parts of Central America which we ought to study, and a great volcanic chain goes right through Nicaragua, where, as a Government, we have some interest. And now we have an active volcano in northern California

It seems as though the time had arrived for the United States to do something about this work, which has already been attacked by other nations and has a very large bearing on the safety of humanity, on problems of urban construction, and on problems of agricultural engineering.

I understand there is a national park project for Hawaii which is coming before Congress through another committee, without involving any expense, and which involves the active volcanoes. I think this scientific work as it was seen, Mr. Chairman, by the congressional delegation which was in Hawaii last summer met their approval. They saw that we are getting results, and we have an uphill row to

hoe under present conditions. We want the thing to be made permanent. We have got there in that wonderful lava vent and in the local harmless earthquakes on the island of Hawaii a marvelous experimental laboratory that somebody will take hold of; some European nation will send their scientists there permanently if the United States does not do it. It is the most perfect place in the world for such investigations. It is in the middle of the Pacific, an ocean bordered by earthquake regions and volcano lands that belong to the United States.

That the Government should found earthquake and volcano observatories has been urged for years by scientific associations. The Geological Society of America, the American Association for the Advancement of Science, the various geographical societies, and the Smithsonian Institution (a Government institution) have all urged the importance of Federal support in view of the tremendous disasters from these sources during the twentieth century. So it does not seem unfitting that the Government should aid with some such small appropriation as is asked in this case—$18,000—for adding the Hawaiian Volcano Observatory to the United States Weather Bureau, creating there a division of seismology, with stations on active volcanoes within the Federal domain and in the West Indies and Central America, and developing a method of systematic mapping of local earthquakes.

The CHAIRMAN. Prof. Jaggar, have your studies brought you to any conclusion as to the relationship between these volcanoes and atmospheric conditions which would affect the weather?

Prof. JAGGAR. I have made out, Mr. Chairman, a brief answer to that question in the form of separate arguments, which I would be very glad to make a part of the record if you so desire. May I read this?

The CHAIRMAN. Yes.

Prof. JAGGER. It is as follows (reading):

ARGUMENTS FAVORING WEATHER BUREAU AND DEPARTMENT OF AGRICULTURE AS AGENCY FOR VOLCANO OBSERVATORIES.

1. Modern volcanology is primarily a science of gas action—hot gases from the earth added to the air.

2. These gases exert profound effect on vegetation.

3. The lands concerned in prediction of volcanic eruption are agricultural lands, like Hawaii.

4. The fault rifts which move during earthquakes affect aqueducts, viaducts, dams, culverts, and other agricultural engineering.

5. Japan, Russia, and other lands place their earthquake and volcano service in cooperation with their meteorological services.

6. The Weather Bureau is the only Government establishment already equipped with hundreds of stations and thousands of special observers.

7. Wind, rain, and barometric pressure strongly affect volcanic activities, and volcanic eruption creates extraordinary weather effects.

8. One of the most difficult problems of volcanology concerns underground water.

Which is one of the fields of inquiry by the Weather Bureau. (Reading:)

9. The temperature of the air exerts critical effects on volcanic vapor and volcanic lava.

10. Dust from volcanoes affects the sun's heat as much as 10 per cent from a single eruption over the northern hemisphere.

This [illegible] determined as a result of the tremendous eruption of [illegible], in 1912, as observed by the Astro-Physical Labo-[illegible], Abbott, here in Washington. He showed that these

columns of dust made a diminution of the sun's heat here in Washington, which for a long time could not be accounted for. It was finally determined that it was due to the probable reflection of the sun's heat through the dust hanging in the upper atmosphere and which surrounds the whole world after an eruption of that kind. You will perhaps remember the sunsets of 1883, which were due to a similar condition of the atmosphere from Krakatoa. (Reading:)

11. Volcanic dust makes new soils, which are subject to botanical investigations for many years; such investigations are now going on in California, Alaska, Hawaii, and the Philippines.

You see, in the case of the volcanic eruptions of Hawaii, the lava flow comes down definitely dated, as the lava flow of 1823, the lava flow of 1855, and so on. And the vegetation pushing in and the surface rotting down in the course of decades gives a definite clue as to the development of the soil. This is particularly true in those areas of thousands of square miles of country which are covered over with a volcanic ash. From Mount Pelee these clouds of dust fell on the decks of ships 900 miles away in the midst of the ocean. (Reading):

12. Forestry is affected by volcanic eruption; Lassen's Peak, Cal.
13. Barometric changes produce earth trembling recorded on seismographs.
14. Tidal rising and falling of volcanic lava in conjunction with sun and moon has been successfully predicted now for years. This promises very important data of prediction even of earthquakes if the work is extended.
15. Finally, the German international committee on earthquakes has been disrupted by the war and other services are disturbed; therefore, the United States should take it up. The Weather Bureau is already strongly equipped in Hawaii. It was the United Fruit Co., an agricultural institution, that sent Mr. Jaggar to investigate the earthquake in Costa Rica.

That is the sum of the reasons why a weather bureau is an appropriate place for volcano and earthquake study.

The CHAIRMAN. I understand that all of the scientific organizations have now agreed that the Weather Bureau should do this work, if it is undertaken at all by the Government?

Prof. JAGGAR. I have seen the directors of the Smithsonian, the Coast Survey, the Geological Survey, and the Carnegie Institution Geophysical Laboratory, and, so far as I am aware, they agree to this proposal that the work be placed in the Weather Bureau. They raise no objections.

The CHAIRMAN. Is there any organization other than the Massachusetts Institute of Technology doing this work at this time?

Prof. JAGGAR. There are voluntary organizations——

The CHAIRMAN. I mean in this country?

Prof. JAGGAR. Not in this country. There is the Volcanic Research Society in Springfield, Mass., that is supporting the work of Mr. F. A. Perret, who is in Italy. He is also receiving some aid from the Carnegie Institution of Washington.

The CHAIRMAN. Do you think this work could be successfully begun with as little as $18,000?

Prof. JAGGAR. I am sure of it, because, if it no more than strengthens and makes permanent the Hawaiian station and makes possible reconnoissance of the field in California and Alaska, it will be well worth while.

The CHAIRMAN. Is it your understanding that the Massachusetts Institute of Technology will continue its interest in this matter if the Government begins it?

Prof. JAGGAR. It is perfectly willing to. The Massachusetts Institute of Technology intends to continue its interest in the work of the Hawaiian Volcano Research Association.

Mr. MCLAUGHLIN. This will be continuous, I presume, if started?

Prof. JAGGAR. I think it ought to be. My idea in such work, in connection with volcanoes and earthquakes, is that before we will have a complete science we ought to have 50 years of work. And I believe that as much may happen for the safety of populations and agriculture and engineering from this kind of work, if carried on systematically and gradually spread—this interest spread to other lands—as has been accomplished by such an organization as the Weather Bureau, which developed from the old Signal Corps. Nobody hoped for the results at that time that have been obtained through the enormous growth of the Weather Bureau in service to the people of the United States.

Mr. MCLAUGHLIN. The suggestion is that $18,000 be the first appropriation. That will be simply to start the work. Do you think it could be carried on year after year with about the same appropriation, or can we look for a growth and extension each year and a lerger appropriation each year?

Prof. JAGGAR. I think with a maximum of $25,000 the work can be carried on for many years.

Mr. MCLAUGHLIN. $25,000 a year?

Prof. JAGGAR. Yes.

The CHAIRMAN. Are there any further questions, gentlemen? If not, we are very much obliged to you, Prof. Jagger, for your statement.

Dr. Marvin, do you care to add anything to this statement?

FURTHER STATEMENT OF MR. CHARLES F. MARVIN, CHIEF OF THE WEATHER BUREAU.

Mr. MARVIN. If you will permit me, Mr. Chairman, I wish to make a brief statement in regard to the matter of handling this appropriation in the Weather Bureau estimates.

We think that no change of the language is necessary. The volcanological study, or the study of earthquakes, is simply the study of seismology. You will notice on page 23 of the estimates, item 45, that the language is "For necessary expenses in the city of Washington incident to collecting and disseminating meteorological, climatological, and marine information, and for investigations in meteorology, climatology, seismology, evaporation, and aerology." The word "seismology" in there covers all of this work. That same language is written in item 47. Item 45 is for work in Washington and item 47 is for the same kind of activities outside of Washington. So it seems unnecessary to make any change in the language of the appropriation, especially as the hearing has shown that volcanology and seismology are simply one and the same thing.

The CHAIRMAN. If you did change that language at all, you would just add the word "volcanology"?

Mr MARVIN. We would just add "volcanology" if that was deemed necessary. That, however, is a matter for the committee to decide.

The CHAIRMAN. I do not know how the committee feels about it, but I feel personally that if we undertake this new work it would

be well to indicate it in the beginning and to at least set that fact out for the information of Congress.

Mr. McLAUGHLIN. If this work is to be undertaken, it may be necessary to increase the appropriation provided under item 45 and also 47.

Mr. MARVIN. No, sir. This work would not change the funds for the work in the city of Washington.

Mr. McLAUGHLIN. This would be all outside of Washington?

Mr. MARVIN. In the field; yes, sir. We ask simply that the amounts in the field appropriation be increased by $18,000.

The CHAIRMAN. That is in item 47?

Mr. MARVIN. That is in item 47. We do not ask for any increase in the expenses in Washington, although there will be a little administration and supervision of the work properly chargeable against Washington expenses.

Mr. HAUGEN. The $18,000 is included in the item?

Mr. MARVIN. No, sir. This is a new project, submitted to the committee since the estimates were prepared.

Mr. HAWLEY. Have you submitted a supplemental estimate on this?

Mr. MARVIN. The supplemental estimate for this was read the other morning in a letter from the Secretary of Agriculture.

The CHAIRMAN. That will be found in the hearings on the Weather Bureau.

Mr. MARVIN. We did not set out the subamount in the supplemental estimate; the $18,000 increase we ask for should be subdivided in item 47 so as to increase salaries by $10,000, special observations and reports by $2,000, with the remaining $6,000 added to the total sum, so that this appropriation would then read: Not to exceed $646,720 for salaries, $135,540 for special observations and reports, and, finally, the total sum, $1,278,150. Those sums should be changed in that way to include this increase of $18,000.

I think that is all.

The CHAIRMAN. We are very much obliged to you.

Prof. JAGGAR. May I say a word on that question of seismology? I have thought a good deal about that, and the Secretary of Agriculture asked me that question; as to whether volcanology is included in seismology, and I was not prepared to answer fully. But, as I see the situation now, it seems to me entirely appropriate that the Weather Bureau, which has heretofore not made any seismological observations at all, spending very little money on this subject, should naturally place a laboratory for experimental purposes on active volcanoes like Lassens Peak, where there are many small shakes; and one of the main functions of such work of the Weather Bureau's new project is to develop a small instrument that can be spread around among hundreds of observers for recording local earthquakes in the territory of the United States (something that has never been done, so far as we know, at any place in the world) suitable for showing the tilting movements and measuring and recording the little movements where the rifts or fault lines are.

Mr. HAWLEY. Are there many such?

Prof. JAGGAR. Oh, yes; the State of California and the northern Pacific coast States are full of those fault lines, as geologists call them, that run through the mountain ranges. Those are the mountain

ranges that were heaved up from the sea, and they are being pushed up on the Pacific side and follow the beach lines, and all that sort of thing—that indicates rapid motion. The small earthquakes are an index of where that rapid motion is taking place. The work that the Weather Bureau could do would be to locate those small movements. We have aimed to put them all over the Island of Hawaii, by placing them in the hands of postmasters, school masters, plantation managers, and that sort of people. It would simply be a small instrument that would be self-recording, operated by a clockworks, showing where the little quakes are, how many there are, and what their intensity is.

Mr. McLAUGHLIN. In engineering matters you would advise against the construction at certain places or recommend a different kind of construction?

Prof. JAGGAR. A different kind of construction, if you have to cross such a rift line. For instance, Mr. John R. Freeman—I think you have a letter in some other report where they built an earthquake-proof dam in connection with one of these water projects in California, and it is of the utmost importance to know what you are about when you are dealing with rift lines which make such tremendous movements when an earthquake takes place. For instance, in the San Francisco earthquake there was a sidewise movement of about 15 feet, and the trolleys and mountain lines and everything were offset 15 feet. So that, if those improvements are going to cross these fault lines, in order to determine the character of the construction you have to build, you want to know this.

Mr. McLAUGHLIN. Those fault lines are often found in mining, where a vein of ore is lost due to a shifting of the rock, and they do not know whether the vein is on the one side or on the other or up or down.

Prof. JAGGAR. These fault lines about these sea-level places are different from the ones that are in motion to-day, and we want everything possible done to interpret what the maximum motion is. So that, if the Weather Bureau should place its seismological station at an active volcano—and that is practically what would be done in Hawaii—I do not see why there is any need for a change in the language. With this small appropriation, the Weather Bureau can hardly hope to do more than place some seismological stations at the volcanoes.

Mr. HAUGEN. If this work was taken up by the Weather Bureau, is it the purpose of your organization to continue its activities along this line?

Prof. JAGGAR. No; it appears in this document that I have passed around that the Hawaiian Volcano Research Association goes on record as favoring, subject to the approval of the Massachusetts Institute of Technology, which has been obtained, a conveyance of the Hawaiian volcanac laboratory and its appurtenances to the United States Government in the event of the creation of a bureau for this purpose or of its being taken over by an existing bureau.

(Thereupon, at 11.30 o'clock a. m., the committee took a recess until to-morrow, Wednesday, January 19, 1916, at 10 o'clock, a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Tuesday, January 11, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. Gentlemen, turn to page 35 of your Book of Estimates, and this morning we will take up the Bureau of Animal Industry. Dr. Melvin, chief of that bureau, who is here, will present the estimates in his own way.

STATEMENT OF DR. A. D. MELVIN, CHIEF OF THE BUREAU OF ANIMAL INDUSTRY.

The CHAIRMAN. Doctor, I will ask you this morning to take up the statutory roll. Your first change is in item 4, page 35, "one executive clerk (by transfer of one assistant chief of miscellaneous division, $2,000, from lump fund for administrative expenses, with change of title)." That seems to be only a change of title. I would like to ask you, however, if there has been any reduction in the lump fund from which this clerk has been transferred?

Dr. MELVIN. There is a reduction of the same amount, $2,000.

The CHAIRMAN. You changed the title to make it conform to the character of the work?

Dr. MELVIN. To the character of the duties of the person; yes, sir.

The CHAIRMAN. On page 36, item 5, there seems to be an increase of $120 in the salary of one executive clerk, and a change in his title. Tell us about that, please.

Dr. MELVIN. This contemplates the promotion of one $1,800 clerk to $1,920, with a change of his title from "clerk" to "executive clerk." This man is in charge of our accounts, and we feel that his duties warrant this slight promotion.

The CHAIRMAN. How many men is he in charge of?

Dr. MELVIN. About 15.

The CHAIRMAN. As I understand it, from running over your statutory roll, this is the only salary increase recommended by you.

Dr. MELVIN. That is the only increase; yes, sir.

The CHAIRMAN. Of $120?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Take item 6, where you have a decrease of one by change to one executive clerk at $1,920. That has reference to the item above?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Under item 15 you have 45 clerks of class one, an increase of 3 by transfer from lump funds for dairy industry, eradication of hog cholera, and meat inspection. Are those respective funds correspondingly reduced?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Gentlemen, I am looking over the statutory roll of the Bureau of Animal Industry, and I see that in all cases where there have been transfers from the lump funds to the statutory roll, the lump funds have been reduced accordingly. Is that correct, Doctor?

Dr. MELVIN. That is correct; yes, sir.

Mr. ANDERSON. Now, Mr. Chairman, right on that point: I suppose that is true in a very large sense, but it may be entirely true with respect to the Bureau of Animal Industry. But I find that there are many instances in the estimates where it is stated that the lump-fund appropriations have been correspondingly reduced in proportion to the salaries added to the statutory list, where there are in fact actual increases in the lump-sum appropriations.

The CHAIRMAN. Actual increases over and above——

Mr. ANDERSON. The amount now carried in the bill.

The CHAIRMAN. That may be true, but still there might be a reduction so far as the particular item is concerned. For instance, say there is an item of $10,000 and there has been a clerk at $1,000 transferred from that item to the statutory roll made that there is a reduction of $1,000 there. Now, here might appear on the face of it an increase of $10,000. That increase would be set out in the estimates, as I understand it, and the purpose for which the increase was made would be set out. Is that true, Doctor?

Dr. MELVIN. Yes, sir; in all cases where we have asked for increases, those increases are definitely provided for by projects showing the amount of money required for each line of work.

Mr. ANDERSON. I do not see the purpose of saying that the fund is reduced by a transfer where, as a matter of fact, you actually increase it. It is a mere matter of bookkeeping, anyhow, and the only effect of it, it seems to me, is to lead people who read these estimates into a belief that there is a reduction where no actual reduction is made.

Dr. MELVIN. The purpose of making these transfers is to comply with a provision enacted about 1901, I think, which then required that all employees of the clerical grade should be provided for on the statutory roll. Before that, where clerks were engaged in field work and were paid out of lump funds, it was usual to carry them on year after year; but in consequence of this change in legislation, it was necessary for us to provide for them in this way, which we have done ever since.

Mr. ANDERSON. I notice, however, that where a transfer of that kind is made, the following year the same place seems to appear again in the lump sum.

Dr. MELVIN. I think not. Of course, as our work increases, we require more clerks and assistants; but it is only where there has been an increase in the work itself that there has been any increase in the clerical force.

Mr. HELGESEN. I do not know what the actual facts are, but I can readily see how a man can be transferred from the lump sum to the statutory roll, and still that might mean a reduction in the lump-fund roll. Suppose the lump-fund roll provides for $20,000 this year and they want an increase of $5,000 for next. If they had not transferred the man they would ask for $25,000; but, having transferred a $2,000 man to the statutory roll, they are asking

for only $23,000. Now, that actually reduces the lump-fund roll by $2,000, and yet there is an increase of $3,000 in the actual amount of the lump-fund item.

Mr. ANDERSON. I understand that, but the whole proposition merely results in a confusion of the accounts, which nobody except an actuary and a Philadelphia lawyer could figure out.

The CHAIRMAN. I would be very glad, Mr. Anderson, if you would watch these very carefully as we go along and try to help us verify the statements made from time to time.

Mr. WILSON. Being a new Member, I would like to ask a question on item 15 there, where 45 clerks are asked for and there is an increase of 3 by transfer from the lump funds for dairy industry, eradication of hog cholera, and meat inspection. Are those 45 clerks classified, and do part of them do dairy work, part hog-cholera work, and part meat-inspection work?

Dr. MELVIN. Yes, sir.

Mr. WILSON. In what proportion? How are those 45 clerks divided?

Dr. MELVIN. I could not give the exact figures as to how many of those 45 clerks are doing the various classes of work. I can give you that later, of course, if you desire.

Mr. WILSON. If there is an increase of 3, does that mean you had 42 clerks last year for this same work?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Does it mean exactly that, Dr. Melvin? You had in this class last year 42 clerks on the statutory roll doing this work and 3 clerks on the lump-sum roll doing the same work that they are doing this year. That is what you are getting at, Mr. Wilson?

Mr. WILSON. Yes.

Dr. MELVIN. Those three clerks were brought into the work last year and paid from the lump fund, and now it is proposed to transfer them to the statutory roll.

Mr. WILSON. I see.

Dr. MELVIN. The other 42 were provided for last year.

The CHAIRMAN. Your next item is 18, in which you have an increase of 6 clerks, 1 by transfer from the lump fund for dairy industry; 1 from diseases of animals; 1 from control of viruses, etc.; and 3 from meat inspection. In that case, your lump funds for each of those items have been reduced accordingly?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. And those clerks have been transferred to the statutory roll in accordance with the policy of the department to transfer this character of people to the statutory roll?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Is that true in all these transfers to your statutory roll; that is, has there been a corresponding reduction of the lump fund by reason of the transfers?

Dr. MELVIN. I think so. I do not think there have been any additions since this estimate was made.

Mr. WILSON. In other words, he is making these temporary clerks this last year permanent for this coming year?

Dr. Merriam. [illegible]

Mr. Wilson. Putting them on the permanent roll.

Dr. Merriam. [illegible]

Mr. Wilson. That is the idea.

Dr. Merriam. Putting them on this statutory roll.

Mr. Wilson. That is what you call the permanent roll.

Mr. Appropriation. They were permanent before, but their salaries were not fixed.

Dr. Merriam. They were just as permanent under the general fund as they would be here, only this sets them out at specific salaries and there will not be any increase in their salaries except by promotion in the case of vacancy in higher grade.

The Chairman. In item 1 all of the salaries of those clerks are $1,000 and $900, respectively. In item 2, 2 clerks were heretofore carried on the lump fund for eradicating the cattle tick, and I was wondering why it was that those clerks of this grade were heretofore carried on the lump fund instead of the statutory roll. [illegible] transfer from the statutory roll, fund for eradicating cattle ticks, to roll, eradicating hog cholera, from secretary's office, all to Bureau of Animal Industry. Strikes Dr. Melvin, not Mr. Harrison, from the Secretary's office, also two from that office.

Dr. Merriam. [illegible]

Mr. Wilson. The [illegible] Mr. [illegible] So that, in effect, [illegible] the transfer in the statutory roll, which is the estimates of [illegible] the [illegible] of the [illegible] of 1906. The [illegible] administration [illegible] permanent and the appropriation [illegible] temporary. [illegible] it was not [illegible] [illegible] transferred to the statutory [illegible] [illegible] [illegible]

The CHAIRMAN. In each instance where the lump-fund appropriation has been reduced you have set it out in the items?

Mr. HARRISON. Yes, sir.

Mr. WILSON. In other words, the lump-fund roll is $375,000——

Mr. HARRISON. The permanent annual appropriation for meat-inspection work, passed in 1906, is $3,000,000.

Mr. WILSON. And you also had a lump fund of $375,000?

Mr. HARRISON. Yes, sir; during the past few years. A similar item is included in the estimates which are now under consideration.

Mr. WILSON. Then, by placing these clerks in this way, you will reduce that lump fund of $375,000, the amount carried here, by the amount of the salaries transferred to the statutory roll?

Mr. HARRISON. You will see that it has been done, if you will examine the item.

The CHAIRMAN. But, of course, the same character of work will be carried on by those clerks?

Mr. HARRISON. Certainly.

Mr. ANDERSON. It is a fact, is it not, that in each one of those cases you practically create new places, and that they are all being provided with some other sort of employment from the lump fund or in some other way? Does not each one of those increases represent a new place, practically speaking?

Mr. HARRISON. No, sir; some of those employees have been engaged on meat-inspection work for a number of years and paid from the meat-inspection fund.

Mr. ANDERSON. I know, but you are now providing another job somewhere else, which amounts to the same thing?

Mr. HARRISON. No, sir. Of course, if the necessity arises during the year for the employment of additional clerks to carry on the work, they will be appointed on the lump fund and transferred in the next estimates to the statutory roll.

Mr. ANDERSON. But the necessity does not occur, because in nine cases out of ten your work is just the same as it was before, and when you make the transfer you have to get other men to take the places of those you transfer to the statutory roll?

Mr. HARRISON. They engage in the same work. The work does not change in the slightest.

Mr. ANDERSON. That is not the question; I am not talking about the change of the work; I am asking whether you create a new place.

Mr. HARRISON. No, sir; we simply make a transfer.

Mr. OVERMYER. Does not the volume of work increase from year to year?

Mr. HARRISON. It does.

Dr. MELVIN. Repeatedly, from year to year, an increase is made in the appropriations for the Department of Agriculture. If the work is increased it means that we must increase the employees according to the amount of money. The bulk of this money is paid for the personal services of experts, clerks, etc.

Mr. ANDERSON. Then it is a fact, is it not, that there are new places created in every appropriation bill and that these transfers represent new places? I am not criticizing you if there are, but I want to know whether there are new places or not.

Dr. MELVIN. There are new places created according to the provisions made for them by Congress. If we take on a new line of work we certainly must have additional men to carry on that work, both expert and clerical help.

The CHAIRMAN. Doctor I do not think that is what Mr. Anderson is getting at. Let us see if we can not get this straight, because it is a very troublesome question on the floor of the House. In item 20 you have here 29 clerks, and heretofore they have been paid out of certain lump-fund appropriations carried in this bill. The contention of Mr. Anderson is that you are now transferring those people from your lump-fund roll to your statutory roll and thereby creating new places on your statutory roll. Is that it, Mr. Anderson?

Mr. ANDERSON. Yes.

The CHAIRMAN. And that you are also providing for those same people on your lump-fund roll. Is that it?

Mr. ANDERSON. Either those same people or some other people; the same number of people.

The CHAIRMAN. Will you please answer the question from that point of view, Dr. Melvin?

Dr. MELVIN. I do not think that is the condition of affairs, because the $375,000 meat-inspection item has been decreased accordingly, and no provision is made for replacing these men on the lump fund.

The CHAIRMAN. Let us say that here is John Smith, who heretofore has been paid out of the lump fund for eradicating cattle ticks. We will say he is getting a salary of $1,000 from that fund. Now you are transferring John Smith, with his salary, to the statutory roll. The question in Mr. Anderson's mind is as to whether or not the place heretofore occupied by John Smith on your lump-fund roll is going to be filled by somebody else. Is that the thought, Mr. Anderson?

Mr. ANDERSON. That is part of it, at least.

The CHAIRMAN. And at the same time, a new place created on the statutory roll?

Dr. MELVIN. No; only on condition that Congress provides additional funds for an increase of the tick-eradication work.

The CHAIRMAN. Suppose we increase your appropriation and give you additional funds. In that event, of course, we would expect to give you additional men to spend the fund. But take the particular case of that individual, John Smith, who has been carried on the lump-fund roll and is now transferred to the statutory roll—are you really creating a new place or are you just simply changing the roll from which this man is paid?

Dr. MELVIN. It is merely a change of the roll. John Smith will continue to do the same work next year that he is now doing this year.

Mr. ANDERSON. And who is going to do the work of John Smith under the lump fund?

Dr. MELVIN. He is going to do the same work.

Mr. ANDERSON. The only difference is that he is put on the statutory roll?

Dr. MELVIN. That is correct.

Mr. HELGESEN. Are you authorized by law to use your own judgment in the matter of hiring temporary labor and paying for that out of the lump fund?

Dr. MELVIN. In the case of certain classes of employees we are. The Civil Service Commission limits the employment of temporary labor.

Mr. HELGESEN. Then, as I understand it, as the work grows you find yourself in need of a little additional help and you hire the men and pay them out of this lump fund?

Dr. MELVIN. Exactly.

Mr. HELGESEN. And, then, if your work continues to grow and becomes permanent and you have retained them a sufficient length of time so that you know they are going to be permanent, you transfer them to the statutory roll?

Dr. MELVIN. In the case of clerks; yes, sir.

Mr. HELGESEN. Then the question of whether there would be any additional men to take the place of those who have been transferred would only depend on the increase in the work?

Dr. MELVIN. Exactly.

Mr. HELGESEN. If it is necessary to have them, they would be put on?

Dr. MELVIN. Certainly.

Mr. HELGESEN. If it was not necessary, you would not; and the number which you employ would also depend on the amount of the appropriation Congress gives you?

Dr. MELVIN. Yes.

Mr. WILSON. What are you estimating for in the lump-fund appropriation this year?

The CHAIRMAN. That will appear a little later in the bill, Mr. Wilson, in the pages following.

Mr. STEELE. I want to ask a question. Can you get rid of a clerk that you put on the stautory roll as easily as you can on the miscellaneous roll?

Dr. MELVIN. You mean on account of his efficiency or misconduct or something of that sort?

Mr. STEELE. No; I mean if you wanted to lay off anybody. Take it in my business. I have a decrease of work sometimes. I notice that in all this matter it seems to be an increase all the time. Take the work of the eradication of the tick, for instance. In our country at one time you had a great many men up there, and at this time you have none, as I understand it (maybe you have, but I do not think we need it). I was wondering whether in any of these outbreaks, where you put a great many men on lump-fund salary and then transfer them over to the statutory roll, it is necessary to do that all of the time, or whether at some time you ought not to have a decrease in he work.

Mr. MCLAUGHLIN. They hold onto their jobs just as strenuously if paid out of one fund as if paid from another.

Mr. HELGESEN. As Dr. Melvin has just said, he does not transfer to the statutory roll until he is satisfied the employees have become permanent: that is, that they need them permanently.

Mr. STEELE. Yes; they need them permanently, and that is always at an increased salary, is it not, when you put them over onto the statutory roll?

Dr. MELVIN. These men are transferred at the same salary they are now receiving.

The CHAIRMAN. Now, please make that a little clearer, because I think we ought to get that into the record. All the transfers you have made here from the lump fund to the statutory roll are at the same salaries?

Dr. MELVIN. Yes.

The CHAIRMAN. I think at this point I will ask Mr. Harrison to put into the record the changes from lump-fund sums to the statutory roll in all the department bureaus and offices, so that we can have it at our finger tips. I do not think it is necessary to read it, but it will go into the record, without objection.

(The paper refererd to follows:)

Statement showing proposed changes on the statutory rolls of the Department of Agriculture for the fiscal year ending June 30, 1917.

SUMMARY.

Additions:		
Promotions	$9,860	
New places	40,580	
Transfers from lump funds without corresponding reduction	11,470	
		$61,910
Reductions:		
Places dropped	9,460	
Decreases in salary	660	
		10,120
Net salary increase		[1] 51,790

NOTE.—On July 1, 1915, there was a total of 16,223 employees in the Department of Agriculture, of whom 4,495 were carried on the statutory roll and 11,729 on lump funds.

PROMOTIONS.

	Increase.
Office of the Secretary:	
1 executive clerk, $1,980 to $2,100	$120
1 clerk, $1,600 to $1,800	200
	320
Weather Bureau:	
1 chief of bureau, $5,000 to $6,000	1,000
1 printer or compositor, $1,400 to $1,440	40
5 printers or compositors, $1,250 to $1,440 each	950
14 printers or compositors, $1,200 to $1,440 each	3,360
6 printers or compositors, $1,000 to $1,260 each	1,560
1 instrument maker, $1,400 to $1,440	40
8 instrument makers, $1,200 to $1,440 each	720
1 instrument maker, $1,000 to $1,440	440
	8,110
Bureau of Animal Industry: 1 executive clerk, $1,800 to $1,920	120
Bureau of Plant Industry: 1 mechanician, $960 to $1,080	120
Forest Service:	
1 forest supervisor, $2,600 to $2,800	200
1 draftsman or map colorist, $720 to $900	180
	380
Bureau of Chemistry: 1 food and drug inspector, $2,000 to $2,250	250
Library: 3 clerks, $1,000 to $1,020 each	60
Office of Public Roads and Rural Engineering: 1 director, $4,500 to $5,000	500
Total increase, promotions	9,860

[1] Exclusive of transfers from lump funds to statutory rolls with corresponding reduction in lump-sum appropriations

NEW PLACES.

	Increase.
Office of the Secretary:	
3 clerks, class 2	$4,200
3 watchmen, at $720 each	2,160
	6,360
Office of Farm Management: 1 draftsman	1,440
Bureau of Plant Industry:	
1 clerk	1,500
3 laboratory aids, at $960 each	2,880
	4,380
Bureau of Entomology: 1 messenger boy	480
Division of Publications: 2 skilled laborers, at $720 each	1,440
Bureau of Crop Estimates:	
1 clerk	1,400
2 clerks, at $1,000 each	2,000
3 clerks, at $900 each	2,700
	6,100
Office of Markets and Rural Organization:	
1 administrative assistant[1]	1,980
4 clerks, class 3	6,400
3 clerks, class 2	4,200
3 clerks, class 1	3,600
1 clerk	1,000
2 clerks, at $900 each	1,800
1 telegraph operator	1,400
	20,380
Total increase, new places	40,580

STATUTORY PLACES DROPPED.

	Decrease.
Office of the Secretary:	
1 chief engineer	$2,000
1 painter	1,000
	3,000
Office of Farm Management:	
1 messenger boy	360
1 messenger boy	300
	660
Weather Bureau: 1 skilled mechanic	1,000
Bureau of Plant Industry:	
2 clerks, at $840 each	1,680
4 laboratory aids, at $600 each	2,400
1 laboratory aid	720
	4,800
Total, statutory places dropped	9,460

[1] This position was shown in the estimates, by mistake, as a transfer from lump-fund to statutory roll. It should have been reported as a new place.

STATUTORY SALARY DECREASES.

	Decrease
[illegible]	[illegible]
[illegible] $480 to $240	$240
[illegible] $420 to $240	180
[illegible] at $900 each to $240 each	240
Total statutory salary decreases	660

TRANSFERS OF FUNDS TO STATUTORY ROLLS WITHOUT CORRESPONDING REDUCTIONS IN LUMP-FUND APPROPRIATIONS.

	Increase
Office of the Secretary:	
To statutory roll of office of the Secretary—	
Private secretary to Assistant Secretary of Agriculture	$1,25
[illegible] clerk	1,260
[illegible] superintendent	1,000
[illegible] printer	900
[illegible] messenger	720
[illegible] skilled laborer	1,000
	9,070
To statutory roll of Division of Publications—2 laborers at $600 each	1,200
Total, Office of the Secretary	10,270
Weather Bureau: 1 lithographer	1,200
Total transfers without reduction	11,470

TRANSFERS FROM LUMP FUNDS TO STATUTORY ROLLS, WITH CORRESPONDING REDUCTION IN THE LUMP-FUND APPROPRIATIONS.

Office of Farm Management:	
To statutory roll of Office of Farm Management—	
1 chief of office	$4,000
1 executive assistant	2,250
1 clerk, class 2	1,400
2 clerks, at $1,100 each	2,200
1 clerk	1,080
2 clerks, at $1,000 each	2,000
3 clerks at $900 each	2,700
1 clerk or map tracer	840
1 lantern slide colorist	720
1 laborer	360
1 library assistant	1,440
1 photographer	1,000
1 draftsman	1,200
2 draftsmen, at $900 each	1,800
	22,990
To statutory roll of Office of the Secretary—1 clerk, class 2	1,400
Total, Office of Farm Management	24,390
Weather Bureau: To statutory roll of office of the Secretary—part salary of 1 assistant in charge of information	750
Bureau of Animal Industry:	
To statutory roll of Bureau of Animal Industry—	
1 executive clerk	2,000
3 clerks, class 1	3,600
6 clerks, at $1,000 each	6,000
[illegible] clerks, at $900 each	26,100
[illegible] oratory helper	1,020
[illegible] oratory helper	600
[illegible] nter	1,140
[illegible] r, skilled laborer, or laborer	720
[illegible] , at $480 each	2,880

Bureau of Animal Industry—Continued.
To statutory roll of Bureau of Animal Industry—Continued.

1 laborer	$240
2 messenger boys, at $360 each	720
2 charwomen, at $480 each	960
1 charwoman	360
1 charwoman	300
3 charwomen, at $240 each	720
	47,360
To statutory roll of Office of the Secretary—	
Part salary of 1 assistant in charge of information	750
1 inspector	2,250
3 clerks, class 3	4,800
1 clerk	1,000
1 clerk	900
	9,700
Total, Bureau of Animal Industry	57,060

Bureau of Plant Industry:
To statutory roll of Office of the Secretary—

Part salary of 1 assistant in charge of information	750
1 watchman	720
	1,470

Forest Service:
To statutory roll of Forest Service—

1 clerk, class 3	1,600
1 clerk	1,300
2 clerks, class 1	2,400
1 clerk	1,100
1 clerk or proofreader	1,400
1 clerk or translator	1,400
1 clerk or compositor	1,600
1 draftsman or surveyor	1,500
2 draftsmen or surveyors ,at $1,400 each	2,800
2 draftsmen, at $1,200 each	2,400
1 draftsman	1,000
1 draftsman or artist	1,200
1 draftsman or negative cutter	1,200
1 blue printer	720
1 carpenter	1,200
1 laboratory aid and engineer	1,000
2 laboratory aids and engineers, at $900 each	1,800
1 laboratory aid and engineer	800
	26,420
To statutory roll of Office of the Secretary—	
1 clerk, class 1	1,200
1 tinner's helper	720
1 assistant messenger or laborer	720
	2,640
Total, Forest Service	29,060

Bureau of Chemistry:
To statutory roll of Bureau of Chemistry—

3 clerks, class 1	3,600
10 clerks, at $900 each	9,000
1 clerk	720
2 food and drug inspectors, at $1,400 each	2,800

Bureau of Chemistry—Continued.	
To statutory roll of Bureau of Chemistry—Continued.	
1 assistant	$1,600
1 laboratory helper, messenger boy, or laborer	720
1 mechanic	1,400
1 mechanic	1,200
1 mechanic	1,020
1 mechanic	960
1 mechanic	900
3 messenger boys or laborers, at $480 each	1,440
1 messenger boy or laborer	360
	25,720
To statutory roll of Office of the Secretary—	
Part salary of 1 assistant in charge of information	750
1 assistant	2,000
1 messenger or laborer	660
	3,410
Total, Bureau of Chemistry	29,130
Bureau of Soils:	
2 clerks, at $900 each	1,800
1 draftsman	1,000
1 laboratory helper	1,000
2 laboratory helpers, at $840 each	1,680
1 instrument maker	1,200
1 machinist's helper	900
Total, Bureau of Soils	7,580
Bureau of Entomology:	
1 administrative assistant	2,250
2 clerks, class 1	2,400
3 clerks, at $1,000 each	3,000
2 clerks, at $900 each	1,800
5 clerks, at $840 each	4,200
1 entomological preparator	1,000
2 entomological preparators, at $840 each	1,680
7 entomological preparators, at $720 each	5,040
1 entomological preparator	600
2 messengers or laborers, at $900 each	1,800
1 messenger or laborer	840
1 messenger or laborer	720
1 messenger boy	360
1 mechanic	1,080
1 mechanic	900
1 laborer	600
1 laborer	480
1 laborer	420
Total, Bureau of Entomology	29,170
Bureau of Biological Survey:	
1 clerk, class 3	1,600
2 clerks, class 2	2,800
1 clerk	1,260
1 clerk	1,080
1 clerk	840
1 clerk	720
1 preparator	900
1 messenger boy	360
Total, Bureau of Biological Survey	9,560

Library, Department of Agriculture:	
1 messenger, messenger boy, or laborer	$360
1 charwoman	480
Total, Library	840
States Relations Service:	
1 clerk, class 3	1,600
2 clerks, class 2	2,800
5 clerks, class 1	6,000
3 clerks, at $1,000 each	3,000
6 clerks, at $900 each	5,400
2 clerks, at $720 each	1,440
1 library cataloguer	900
1 messenger, messenger boy, or laborer	600
1 messenger, messenger boy, or laborer	480
1 messenger, messenger boy, or laborer	360
1 messenger, messenger boy, or laborer	300
1 laborer or charwoman	480
5 laborers or charwomen, at $240 each	1,200
Total, States Relations Service	24,560
Office of Public Roads and Rural Engineering:	
To statutory roll of Office of Public Roads and Rural Engineering—	
1 model maker	1,800
1 clerk, class 3	1,600
1 clerk, class 1	1,200
1 draftsman	1,320
1 clerk or skilled laborer	1,000
1 mechanician	1,680
1 lantern-slide colorist	1,320
1 carpenter	1,200
1 messenger or laborer	840
1 messenger or laborer	660
2 laborers, messengers boys, or charwomen, at $480 each	960
2 charwomen, at $240 each	480
	14,060
To statutory roll of Office of the Secretary—	
1 clerk	900
2 elevator conductors, at $600 each	1,200
1 watchman	720
	2,820
Total, Office of Public Roads and Rural Engineering	16,880
Office of Markets and Rural Organization:	
To statutory roll of Office of Markets and Rural Organization—	
1 chief of office	4,500
1 clerk, class 4	1,800
3 clerks, class 2	4,200
1 clerk	1,380
1 clerk	1,320
8 clerks, class 1	9,600
1 clerk	1,140
4 clerks, at $1,000 each	4,000
1 clerk	1,080
7 clerks, at $900 each	6,300
1 clerk	840
2 clerks, at $720 each	1,440
1 mechanical assistant	1,800

Office of Markets and Rural Organization—Continued.

To statutory roll of Office of Markets and Rural Organization—Continued.

1 mechanical assistant	$1,380
2 laboratory aids at $900 each	1,800
3 laboratory aids at $720 each	2,160
1 photographer	1,400
1 photographer	1,200
1 telegraph operator	1,200
1 ship rider	900
1 ship rider	480
1 laborer	720
1 laborer	660
2 messenger boys or laborers, at $600 each	1,200
3 messenger boys or laborers, at $540 each	1,620
4 messenger boys or laborers, at $480 each	1,920
1 messenger boy	420
2 charwomen, at $480 each	960
1 charwoman	300
2 charwomen, at $240 each	480
	58,200

To statutory roll of Office of the Secretary—

1 law clerk	2,750
1 clerk	900
1 elevator conductor	600
	4,250
Total, Office of Markets and Rural Organization	62,450

Enforcement of the Insecticide Act.

1 executive officer	2,750
1 executive assistant	2,000
1 clerk, class 3	1,600
1 clerk, class 2	1,400
1 clerk, class 1	1,200
2 clerks, at $1,140 each	2,280
2 clerks, at $1,000 each	2,000
3 insecticide and fungicide inspectors, at $1,600 each	4,800
2 clerks and sample collectors, at $1,000 each	2,000
1 laboratory helper	840
1 laboratory helper	720
1 laboratory helper	600
1 unskilled laborer	600
1 unskilled laborer	480
1 messenger boy	480
1 messenger boy	360
1 charwoman	480
Total, Enforcement of the Insecticide Act	24,590

Federal Horticultural Board:

1 secretary of board	2,280
2 clerks, at $1,440 each	2,880
2 clerks, class 2	2,800
2 clerks, at $1,260 each	2,520
1 clerk	1,080
1 clerk	1,000
1 messenger boy	480
1 messenger boy	360
1 charwoman	240
Total, Federal Horticultural Board	13,640

NSFERS FROM LUMP FUNDS TO STATUTORY ROLLS, WITH CORRESPONDING REDUCTION IN THE LUMP-FUND APPROPRIATIONS—SUMMARY.

ce of Farm Management	$24,390
ather Bureau	750
reau of Animal Industry	57,060
reau of Plant Industry	1,470
rest Service	29,060
reau of Chemistry	29,130
reau of Soils	7,580
reau of Entomology	29,170
reau of Biological Survey	9,560
brary	840
ates Relations Service	24,560
ice of Public Roads and Rural Engineering	16,880
ice of Markets and Rural Organization	62,450
forcement of the insecticide act	24,590
deral Horticultural Board	13,640
Total transfers from lump funds with corresponding reduction	331,130

NSFER FROM STATUTORY TO LUMP-FUND ROLL, WITH CORRESPONDING REDUCTION IN LATTER ROLL.

reau of Animal Industry to Office of Public Roads: 1 architect, om statutory roll, Bureau of Animal Industry, to lump-fund appropriation for rural engineering, Office of Public Roads and ural Engineering	$900

Mr. McLAUGHLIN. Now, as to whether or not those men are permanent employees, there seems to be an impression here that some them are permanent and some are not. As I understand it, en a man gets a job on account of having passed a civil-service mination he becomes a permanent employee, and if the work he s engaged to do in the first instance is completed he is not pped, but some other job is found for him; that the department s out and finds new work for him; and that a man never is pped from any of these rolls unless the Lord takes him.

The CHAIRMAN. Let us ask Dr. Melvin about that. That may true, practically, but it is not theoretically true. What about t, Doctor? Do you drop any of those except when the good d takes them?

Dr. MELVIN. We do not think the man's employment in these tutory positions is any more permanent than it might be (I do say than it always is, but than it might be) on the lump fund. e position, of course, is permanent until Congress abolishes it. We vide, for instance, for so many clerks at so much each, and that kes it permanent until Congress changes it. We might employ men under the miscellaneous fund, and at any time that the rk decreased we could lay off 2 or 3, or as desirable. It is elastic provision.

Mr. McLAUGHLIN. You could lay them off, but what is the prac- ?

Dr. MELVIN. We could lay those off.

Mr. McLAUGHLIN. You could; but do you do it?

Dr. MELVIN. Not often, because, as I have previously explained, work of the department has increased from year to year, and re has been no occasion to lay off clerks. If, for any reason,

Congress should not make it possible the funds to carry on the work as we have been carrying it on, or should decrease it, those men would be increased accordingly.

Mr. [illegible], I take it it is necessary to lodge a discretion somewhere, and there is a discretion lodged in your bureau to determine the necessities of the case in each instance as to whether these men are needed or not.

Dr. Marvin. Yes, sir.

Mr. [illegible]. And you have that discretion, do you not?

Dr. Marvin. Yes, sir.

The Chairman. The point is however that once you create a situation under that is Mr. McLaughlin's home there is no way of gauging out of it anywhere except on the intervention of Providence. That is sometimes true, but generally it is not true, is it?

Dr. Marvin. I do not think it is true, either in theory or practice.

The Chairman. Whenever the work of one of those employees [illegible] right, notwithstanding the fact the [illegible] Congress to drop him?

Dr. Marvin. [illegible] of him. The organization does not refer [illegible] to the position. I do not feel that the civil-[illegible] the appointment of a man in those particu-[illegible] that the man has got a permanent life-[illegible]

The Chairman. That is what I had in mind.

Mr. [illegible]. Owing to the cut in the [illegible] employees, [illegible] the other [illegible]

Dr. Marvin. No.

Mr. Watson. [illegible] those [illegible]

Dr. Marvin. [illegible] these statu-[illegible] pay.

Mr. Watson. [illegible] I will transfer [illegible] to the statutory roll and [illegible]

Dr. Marvin. Certainly.

Mr. Watson. [illegible] him on some other work that he could be used upon, would you not?

Dr. Marvin. Yes.

Mr. Henderson. But that would be changing his position; that would be simply a change of work.

Mr. Watson. That is, you have got to make a change of his position, but it would be a change of the work, merely.

Mr. Overmyer. What I mean, Doctor, is that you have a discretion to change those men from one of the [illegible] to their employment, or to leave them of their own accord [illegible] their use any further; you have that discretion?

Dr. Marvin. I see no [illegible].

The Chairman. If that is all, we will take up the next item, which is a transfer of one [illegible] to [illegible] on the [illegible] roll. I presume that is a [illegible]

Dr. Marvin. Yes, sir; that line of work was taken up by the Office [illegible] and Rural Engineering, and this item was transferred.

The CHAIRMAN. You have a man doing the same character of work that he was doing in your bureau?

Dr. MELVIN. Yes, sir.

Mr. ANDERSON. I would like to go back to item 20 again.

The CHAIRMAN. All right.

Mr. ANDERSON. I notice here there are transfers of eight from the lump-fund appropriation for the eradication of hog cholera. Now, I understand it is the purpose of the bureau to abandon a large portion of the hog-cholera work, is it not?

Dr. MELVIN. That is a question for Congress to determine.

Mr. ANDERSON. The estimates provide that; they are based on that theory?

Dr. MELVIN. Yes, sir.

Mr. ANDERSON. Then what is the purpose of transferring these men from the hog-cholera work? Is it to give the same fellow who also has a job in the hog-cholera work a job on the statutory roll? Why are not those men who will not be provided for under the hog-cholera work simply dropped, instead of transferring them to this item here?

Dr. MELVIN. If there is no provision made finally for this line of work those men who are now there will be dropped or transferred to some other work where their services may be needed; one or the other.

Mr. ANDERSON. In other words, if the hog-cholera item is reduced, as you propose in your estimates, and this transfer were not allowed, the same men would have to be dropped from the rolls?

Dr. MELVIN. There would be no work for them.

The CHAIRMAN. Now, let us see about that, Doctor, for a moment. These estimates, I take it, are made up on the theory that certain things are going to be done, and this statutory roll was made up on the theory that certain lump-fund appropriations were going to be made. Is that true?

Dr. MELVIN. They were made on our present expenditures. These men are now engaged in clerical work in hog-cholera eradication, and this was to provide for their transfer to statutory positions.

The CHAIRMAN. I know.

Dr. MELVIN. Now, then, if there is no provision whatever for the hog-cholera eradication work we would necessarily be obliged to drop those men, because there would be no work for them to do.

The CHAIRMAN. You do not quite catch what I am driving at. You would not make up this statutory roll providing for a number of clerks unless you did it upon the theory that certain lump-fund appropriations were going to be made for certain lines of work——

Dr. MELVIN. Yes, sir.

The CHAIRMAN (continuing). So that those people would find profitable employment. Now, then, does your answer to Mr. Anderson's question quite mean what you say it means, that these eight men have been transferred here with no reference whatever as to what is contemplated in this bill in connection with those estimates for hog-cholera work? That is the conclusion your answer might lead to.

Dr. MELVIN. We presumed Congress would make some provision for hog-cholera eradication work. We did not feel that that work

would be dropped immediately, but we did not know in what form Congress would make that provision.

Mr. McLAUGHLIN. What change have you recommended in the amount to be used for it?

Dr. MELVIN. We have recommended $1,500,000 for serum-control work and research work on hog cholera.

Mr. WILSON. Is that an increase or a decrease, as compared with your recommendation of a year ago?

Dr. MELVIN. It is a decrease.

Mr. WILSON. Is it less?

Dr. MELVIN. Yes, sir.

Mr. OVERMYER. On the theory that hog cholera is less troublesome?

Dr. MELVIN. No, sir. Congress provided the first year $600,000 for certain lines of work, including $100,000 for dourine. That made $500,000 for hog-cholera and serum work, which was divided into three classes of work. One line of work was where we took certain counties and undertook to eradicate the disease in those counties by having our men there actually treat the hogs that might be sick or exposed. Another was more in the way of extension work, where our men went out and made demonstrations in various parts of the county in treating hogs with serum and in holding meetings with farmers, county agents, and others and extending the work in that way. The third line of work had to do with supervising the manufacture of this serum by commercial firms.

Mr. OVERMYER. There is a great deal of cholera now, is there not?

Dr. MELVIN. Yes; there is.

Mr. OVERMYER. I know there is a great deal in Ohio at this time.

Dr. MELVIN. We have concluded that the time to undertake the complete eradication of hog cholera has not arrived, because we feel it will be impossible to do that with any reasonable degree of certainty and with any reasonable sum of money. It is too prevalent; it is too contagious; it is too readily carried from place to place. It is practically as contagious as the foot-and-mouth disease, there are so many ways for it to spread, and we can accomplish so little——

Mr. OVERMYER. But the financial loss is almost equal to that from the foot-and-mouth disease, is it not, in some sections of the country?

Dr. MELVIN. It would not be, provided the foot-and-mouth disease was as general as hog cholera.

Mr. RUBEY. I want to say this, Mr. Chairman: That at the proper time I will have something to say about this decrease on the hog-cholera proposition, because I am opposed to it; but I do not think this is the proper time to take that up. I think we ought to take it up when we come to it.

Mr. OVERMYER. Yes.

The CHAIRMAN. I was just about to suggest to Dr. Melvin and the gentlemen of the committee that we take that up when we come to it. It is on page 43 of the estimates, and we will take it up when we come to it, because I want these hearings to be a picture, as near as possible, of the various items as they are set forth in the estimates, so as to facilitate the use of the hearings on the floor of the House.

Dr. MELVIN. Mr. Chairman, if it is possible, I would like that to be passed for the time being.

Mr. WILSON. You will come to that later in the estimates.

The CHAIRMAN. Yes; we will come to that. I want to complete the statutory roll, and I want to take you back to Mr. Anderson's proposition of a while ago, because I am afraid if you don't make it clear it is going to leave a wrong impression in the minds of the committee. Your answer to Mr. Anderson's question, to my mind, is misleading. Let me repeat my statement, that this statutory roll is made up, as I understand it, with reference to the lump-fund appropriations provided for later in the bill for your bureau.

Dr. MELVIN. Yes, sir.

The CHAIRMAN. You have 45 clerks here, perhaps 50 clerks in another place, 75 clerks in another item, and 10 clerks in still another item of your bill because it was the expectation of your bureau when this statutory roll was made up that certain lump-fund appropriations estimated for further on in the bill are to be provided by Congress. Is that right or not? Is that a clear statement?

Dr. MELVIN. Yes; that is a clear statement.

The CHAIRMAN. Now, that statement is not entirely what you said in answer to Mr. Anderson's question, and I want to keep you straight on it. These 8 men to whom Mr. Anderson referred, transferred from the lump fund item for eradicating hog cholera, will be used and will be needed if the $185,000 for hog-cholera work, as estimated for by you, is allowed by the committee?

Dr. MELVIN. They will be; yes, sir.

The CHAIRMAN. That makes the proposition clear, I think.

Mr. MCLAUGHLIN. Suppose it is not allowed by the committee; what becomes of those eight clerks transferred to the statutory roll?

The CHAIRMAN. Then the subcommittee would go back to the statutory roll and try to make a corresponding reduction in the number of clerks on that roll, depending on the amount allowed in the lump-fund appropriation. Is that right, Doctor?

Dr. MELVIN. Yes.

Mr. MCLAUGHLIN. That is just what I want to have appear.

The CHAIRMAN. I wanted to have it apear that way, too, because it is very confusing if we do not get these things right.

Now, in item 24 you have transferred there certain laboratory helpers from the lump fund for meat inspection, with a change of title, but with no change in salary, and with a corresponding reduction in the lump fund. Is that true?

Dr. MELVIN. Yes, sir; that is true.

The CHAIRMAN. That is true also of item 25?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. It is true also of item 27, on the next page?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. And it is true also of item 35 on the same page?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. I see there a carpenter at $1,100 that you drop.

Dr. MELVIN. In that case he goes from our bureau to the Secretary's office.

The CHAIRMAN. Yes.

Dr. MELVIN. There is no change in the appropriation in consequence of that.

The CHAIRMAN. Is there objection to change the title of four laborers at $660 from "four laborers, messengers, or messenger boys" at the same salary?

Mr. MELVIN. Yes, sir.

Mr. WILLIS. What about item 36?

The CHAIRMAN. Yes; I overlooked that.

Mr. MELVIN. The purpose is merely to make the designations uniform.

The CHAIRMAN. To make their designations uniform.

Mr. MELVIN. Yes, sir.

The CHAIRMAN. They are doing laboring work, are they?

Mr. MELVIN. Yes, sir; there is no change whatever in their occupations or in their salaries. The proposition is simply to have the men doing the same kind of work have the same designations.

The CHAIRMAN. Where are these men mostly employed—in Washington or on the outside work?

Mr. MELVIN. Nearly all in Washington.

The CHAIRMAN. What do they do in a general way? That is a good many laborers to have in the bureau, I think.

Mr. MELVIN. The majority of them are messengers, who carry documents and things of that sort from one part of the department to another. They are used in work such as messengers are generally assigned to.

The CHAIRMAN. But you are calling them laborers, and now you say they do messenger work. You had it "messengers" at one time and you have changed it to "laborers," because you say they are doing laborers' work, and now you say they are doing messenger work.

Dr. MELVIN. In item 36, Mr. Chairman, they are mentioned as messengers, skilled laborers, and laborers.

Mr. WILLIS. Why would it not be a good idea to mention, if you can, so many messengers, so many skilled laborers, so many laborers?

Dr. MELVIN. That could have been done. It was such a minor matter that it was not done.

The CHAIRMAN. That is very true, though; yet these little items sometimes cause a man in charge of the bill on the floor of the House, and the committee itself, more talking and more trouble than an item carrying $50,000, as members of this committee very well know. I believe when a title is changed on this statutory roll that there ought always to be a good reason for it, because it saves us the trouble of trying to explain it.

Dr. MELVIN. It would not make very much difference if it stands as it was before.

Mr. JAMESON. Do you need this many men?

Dr. MELVIN. We already have the men, and their services are being utilized. This simply proposes a change in the designation of one of them.

The CHAIRMAN. If it will not make any difference, I think we had better let it stand as it was.

That brings us to items 37, 38, and 39, all dealing with the same proposition.

Dr. MELVIN. Yes, sir.

The CHAIRMAN. As to items 40, 41, 42, 43, and 44, those are all titles, or largely changes in titles?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. They are all changes in titles, as a matter of fact.
Dr. MELVIN. Yes, sir.
The CHAIRMAN. Now you come to your charwomen, beginning ith item 46 and running on down through item 51. You have 27 harwomen there. How do you use them, Doctor? Have you eeded that many heretofore?
Dr. MELVIN. Oh, yes; absolutely. We have a great many rooms hat they have to look after and keep clean. Some are used in the aboratories in washing test tubes and other laboratory glassware. o there is an abundance of work for all we have here.
Mr. WILSON. Why is it that you have such a variance in salary? see some of them are getting $480 and others $240.
Dr. MELVIN. That depends largely upon the amount of time they ut in. Those at the higher salaries are engaged all during the day; he others come in the evening or early in the morning, clean up the ffices, and go away.
Mr. MCLAUGHLIN. Have you recommended any decrease in salary r any reduction of your force? First, have you recommended any lecreases in salaries?
Dr. MELVIN. No, sir.
Mr. MCLAUGHLIN. There has been some suggestion of economy nd the necessity for it, and I did not know but that you might ave found some place where there might be a little reduction to ve a little money. It is going to be hard to find money to run the overnment. You have not found it possible to reduce the salary f a single place in your whole bureau?
Dr. MELVIN. Not in the salaries; not in these statutory positions, ecause we expect to require labor in accordance with the salary rovided. Reductions have been made in some instances in lump-nd positions. That is a department matter, and it does not appear re in the estimates. In a few cases there has been an exchange f positions—an employee at $1,000 or a higher salary reduced to a wer salary, and another promoted to that higher salary. That, of urse, could take place very readily, and it does take place from me to time as the necessity may arise.
The CHAIRMAN. I might say in that connection, gentlemen, that e economists of the country have not found it wise to make any duction in our own salaries, either. If we start economizing, we ill have to economize on ourselves somewhat.
Mr. MCLAUGHLIN. That means there is not going to be any econ-my; is that the idea?
The CHAIRMAN. I suppose so.
Mr. STEELE. It means that the high cost of living has come to ay.
Mr. HELGESEN. Mr. Chairman, talking about troublesome ques-ons on the floor of the House, take that item 21; could you answer at? I know I could not.
The CHAIRMAN. What is that?
Mr. HELGESEN. One architect. Some one will want to know what is for.
The CHAIRMAN. I will ask you about that, Doctor, please. Just riefly, what does that man do?
Dr. MELVIN. This architect is employed in the meat-inspection ork, and he has to do with looking over plans of new packing

houses or alterations in old packing houses where we have inspection. The employment of people of that character is provided for in the meat inspection law—experts in sanitation.

The CHAIRMAN. Is that satisfactory, Mr. Helgesen?

Mr. HELGESEN. Yes.

The CHAIRMAN. Then, to page 40 of your estimates, gentlemen, and we will take up the general-expense item, No. 53, for inspection and quarantine work. Paragraph 52 covers merely the general authority for all of the work of the Bureau of Animal Industry.

Dr. MELVIN. Mr. Chairman, if you do not mind, I would like to have Mr. Rawl heard this morning, as he is going to leave the city to-night.

The CHAIRMAN. We will first hear Mr. Rawl, then, on item 55.

STATEMENT OF MR. B. H. RAWL, CHIEF OF THE DAIRY DIVISION, BUREAU OF ANIMAL INDUSTRY.

The CHAIRMAN. That item has to do with investigations and experiment work, dairy and stock, cooperative investigations of the dairy industry in the various States, inspection of renovated-butter factories and markets. Now, Mr. Rawl, I would like to have you take up each particular line of work that you are doing and that you contemplate doing, etc., tell us what you are doing under each item—how much you are expending under each item now, and how much you expect to spend if these items are allowed for the next fiscal year.

Mr. RAWL. Does that apply to the entire appropriation or only to the increases?

The CHAIRMAN. To the entire appropriation. I would like you to give us briefly a statement of what you are doing with that appropriation, and then give us the reason for the increases asked.

Mr. RAWL. This item, covering the whole dairy work, we divide for administrative purposes into the following subdivisions or suborganizations: First, what we call administration—that is, looking after the executive work—for which $16,955 is asked. Do you want this in detail?

The CHAIRMAN. I would like to have it in detail; yes.

Mr. RAWL. I am talking now of the appropriations available for the year ending June 30, 1916.

Mr. MCLAUGHLIN. You are talking now about the fiscal year which ends June 30, 1916?

Mr. RAWL. Yes, sir.

That $16,955 is used for all sorts of general administrative work and includes the branch library, files, requisitions, and accounts, and all general work which relates to more than one section.

The CHAIRMAN. That is the overhead charge of your office?

Mr. RAWL. Yes, sir. The next we designate as dairy farming.

Mr. WOODS. Are you on page 41, line 5?

The CHAIRMAN. Yes.

Mr. WOODS. We can not follow it very well from this estimate.

The CHAIRMAN. That is why I asked him to give it in detail, so that it will go into the record.

Mr. HOWARD. You will find the items of the estimate on page 41 for the expenditure of $675,470 entitled "Dairy industry."

The CHAIRMAN. Gentlemen, to-morrow I will have for each member of the committee a copy of the Program of Work of the Department of Agriculture, which will show in detail the things Mr. Rawl will discuss. It is set out there by actual projects, giving a very clear picture of what the department is doing. I have a copy of my own, but the members of the committee do not, and they will be furnished them to-morrow.

Mr. RAWL. I will name over the subdivisions and the amounts available for each for the present year. I may say that these subdivisions are not adhered to absolutely, but they show the general lines of separation according to which the division is organized. First, administration, $16,955; second, dairy farming, $60,600; third, dairy manufacturing, $42,370; fourth, dairy research laboratories, $3,565; fifth, market-milk investigations, $22,650; sixth, western dairy extension, $31,790; seventh, dairy experimental farm (Beltsville, Md.), $30,160, of which $7,500 is used in the operation of the farm and the remainder is used for experimental work, maintaining the herd, supplying equipment, etc.; to pay for the supplies furnished by the Supply Division $1,000 are required of the Dairy Division, and this makes a total of $254,090.

The branch office at Salt Lake City (western dairy extension) is devoted to educational work in three of the lines already mentioned, namely, dairy farming, dairy manufacturing, and market milk work. That territory is too far away for the work to be directly administered from the Washington office, and it seemed to be economical and desirable to have a small branch office in that section.

Mr. MCLAUGHLIN. How many States are reached from that western station?

Mr. RAWL. Oregon, Washington, Utah, Idaho, Wyoming, Nevada, Montana, Colorado, and New Mexico.

Mr. WILSON. Not in California?

Mr. RAWL. Not in California; no, sir.

The CHAIRMAN. You have discussed administrative expenses. Take up your next item there as you have it outlined; the amount of money you will spend in 1916 you have already given. How much do you expect to spend for the year 1917? Give us a brief description of what you are doing and what work you expect to do in 1917.

Mr. RAWL. The estimates contain an actual increase of $22,620, increasing the total from $254,090 to $272,470. We want to devote this increase mainly to five lines of work—dairy farming, cheese-factory investigations, research laboratory work, market milk work, and experimental work in feeding and breeding.

In the dairy-farming work perhaps some of the members of the committee remember the cow-testing association work that has been started; we have to act as the leaders in this work. Associations have been organized in connection with the local officials who assume the responsibility of carrying on the associations and looking after them. We are taking up now the organization of bull associations. It has been done successfully in a limited way. For these lines of work we desire an increase of $4,000 for the coming year.

The work of the dairy farming section includes all educational work relative to dairy production. In addition, it includes work of

[illegible] which comes to the attention of [illegible] in one way or another. A [illegible] part of the educational work which has [illegible] relates to farmers' problems, most [illegible] dairy specialists that are maintained in the [illegible] engaged in this line of work and act as leaders [illegible] remodeling of some farm houses, etc., [illegible] feeding and breeding of dairy cattle, in the standardization of records, in the organization of cow-testing [illegible] We have met on the half-and-half basis [illegible]

[illegible] of the dairy manufacturing section includes creamery [illegible] investigational and educational work, farm [illegible] inspections, renovated butter inspection, farmer inspection [illegible] dairy department, and a small amount of work is carried [illegible] cheese extension work. Three thousand dollars of the [illegible] is desired for cheese-factory investigations and

[illegible] factories in this country have received little attention [illegible] department, but they represent a very important phase of [illegible] I may take the time, I should like to say something [illegible] here. In 1920 we had an annual export business of [illegible] pounds of cheese. We have gradually lost that [illegible] we are exporting practically no cheese. On the [illegible] since about 1920 we have developed the importation of [illegible] until the import business now amounts to about 60,000,000 [illegible] consisting principally of the higher-priced cheeses.

The CHAIRMAN. What is the value of those imports?

Mr. PAGE. The value is about $11,000,000.

The CHAIRMAN. What has brought about that decrease in the exportation of cheese? Was it home consumption that took it up?

Mr. PAGE. It is probable that consumption, due to increased population, has increased at a rate out of proportion to production. Practically our work in connection with cheese has been of a research character. We have been working on two or three of the specialties of the foreign types, and we have promise that we will be able to manufacture here those varieties which constitute a considerable part of that importation. For instance, take Roquefort cheese. We are making some very fine Roquefort, but the methods are not entirely complete yet because we can not make it of a uniform quality as a manufacturer must do in order to maintain his [illegible]. We have also been working on Swiss cheese and on the common types of cheese which represent the bulk of our American production. Cheese, unlike butter, is restricted to certain climatic conditions. For instance, you will find the cheese districts of the country largely around the Great Lakes.

Mr. HAUGEN. Does that apply to the manufacture of Roquefort cheese especially?

Mr. PAGE. We have no manufacture of Roquefort in this country, because Roquefort is made out of sheep's milk and we have no sheep-milk industry here. We hope to build up a Roquefort industry in this country, using cow's milk.

Mr. HAUGEN. Has climate anything to do with it?

Mr. RAWL. The conditions necessary for the production of Roquefort are peculiar. It is ripened in caves, and naturally certain conditions of coolness and moisture exist there which control the growth of the mold which is peculiar to Roquefort and which makes that growth possible. Nobody in this country has heretofore known very much about the details of the manufacture of this product. If we are going to produce Roquefort in this country, we must, in a measure, reproduce the conditions of coolness and moisture of those caves in order to control the growth of the mold. This we are doing in the Department of Agriculture with artificially cooled rooms.

Mr. HAUGEN. It can be produced in this country?

Mr. RAWL. The Roquefort mold is very common. If you see a piece of mold on bread, it is very often that it is the Roquefort mold. What we do is to grow this green mold on dry bread and use it to inoculate the cheese. But unless you maintain the proper conditions of temperature and humidity, the mold will not grow and will not produce these results. Then there are some chemical difficulties which must be solved when cow's milk is used.

Mr. HAUGEN. You contend that you could produce Roquefort in this country equal to that produced in foreign countries if you had sheep's milk?

Mr. RAWL. Yes, sir; but as we have no sheep's milk we are seeking to develop a method whereby it may be made from cow's milk. Some has been made in an experimental way that many people have pronounced as good as the imported.

Mr. CANDLER. That is made out of sheep's milk?

Mr. RAWL. What we make is from cow's milk.

Mr. WILSON. You say the imported Roquefort is made from sheep's milk?

Mr. RAWL. Yes, sir.

Mr. WILSON. Could you use goat's milk in making it?

Mr. RAWL. I am not sure about that.

Mr. WILSON. If we could, we could get Jack Garner's goats of Texas and have all the Roquefort we wanted.

Mr. RAWL. Coming back to the conditions necessary for the manufacture of all sorts of cheese, it requires a cool climate and certain natural conditions for the production and handling of good milk, and for that reason the regions around the Great Lakes where they have cool nights and comparatively short summers constitute the bulk of our cheese district that are so far developed. In making a study with reference to the whole subject of cheese production, it looks as though we should seek to replace with domestic that which we are now importing. Cheese production is a profitable business and it will stimulate an industry which we feel is becoming more and more essential to our agriculture.

Mr. JACOWAY. Taking it as a whole, what progress have you made?

Mr. RAWL. We have made very little, because we have not done much work on cheese. A large part of our dairy work has been developed within the past 10 years, and the important problems have been taken up gradually as funds would permit. We have thus far been able to do little work on cheese, other than laboratory investigations in the establishment of methods.

[illegible] good milk regions of the country where we can make good cheese. For instance in Montana we think conditions are ideal. In the winter the dairy cows are coming in and starting a large amount of feed. There are a long distance from the low that last spring are an abundance of cool water; and some of these valleys it seems to me would, if developed, make [illegible] those where they are now making some. The same is true of the mountain regions through Virginia, West Virginia, North Carolina and Tennessee.

Mr. Haecker. How do you account for that fact? You say the [illegible] is largely around the Great Lakes, and then you say the best cheese is made in Montana. Is climate the explanation?

Mr. Ayers. I am speaking largely with reference to the temperature of the [illegible] and the quality of the water; because in making good cheese good milk is required, and in making good milk a certain temperature of the maximum of natural cool water is [illegible]. In the mountain part of the Rocky Mountain country [illegible] to those in Montana, and which are ideal for cheese making. There is no melting ice which contributes cool[illegible] and they have a good cool temperature. In [illegible] the farms are small and close together, and a [illegible] territory, thus [illegible] transporting the milk to the cheese [illegible]. The same is true in the mountain sections of western Virginia, North Carolina and eastern Tennessee; they have conditions [illegible] Canada.

I am [illegible] that we have built these little cheese factories [illegible] mountain section, about 50 miles from the railroad. [illegible] you might say. The equipment [illegible] four hundred dollars and a mountain [illegible] the cheese making. In cooperation with the [illegible] a cheese specialist is maintained to [illegible] and this will be continued until the [illegible] Some of those little cheese factories [illegible] as a thousand dollars a month [illegible] which they were located. They want to build [illegible] we want them to hold back, because we [illegible] with our present force. The [illegible] will be used in devising ways and [illegible] We hope, at some future [illegible] to inaugurate the cheese work, [illegible] the work on the selected plans, in cooperation [illegible] as concerned, with the idea [illegible] the work other than such leadership as will be necessary for the department to maintain, particularly [illegible] problems.

The Chairman. And the supervision?

Mr. Ayers. The supervision, yes, sir. Another part of the increase [illegible] is desired for laboratory work.

Mr. Haecker. Where are you reading from?

Mr. Ayers. Item 55, page 41.

Mr. Ayers. Only a small amount of research work has been done [illegible] the dairy problems. For instance, the utilization of [illegible] products of these small creameries, such as buttermilk, in

addition to developing the methods of manufacture of different products. There is a tremendous loss in these small cooperative plants, because they have not been inclined to take up the utilization of by-products.

There are three particular items here in connection with the experimental butter work. One of the problems with which we have been demonstrated by the character of the that the Navy Department is receiving, manufactured [illegible] in connection with the storing of butter that is one of the [illegible] but it is not yet completed. A contract recently under [illegible] to the manufacture of condensed milk. Condensed milk is one of the important branches of the dairy industry and there are [illegible] various problems relating to it which have not been solved. The increase of $5,780 requested for laboratory research work is desired for use in connection with the above-named investigations, namely, dairy by-products, investigations in butter manufacture, and condensed milk.

Mr. ANDERSON. Where is this research work carried on?

Mr. RAWL. Here at our laboratories and at Grove City, Pa.

Mr. HELGESEN. Speaking of buttermilk, they are now making a buttermilk directly from milk. Does that have the same qualities as the real buttermilk?

Mr. RAWL. Just about the same. I have felt it ought not to be called buttermilk, because really it is skimmed milk fermented. In buttermilk, under proper handling, although there is very little more fat in it than in the skimmed milk, yet in the one case you rely on the churn to remove the fat and in the other you rely on the separator; and, as a rule, the separator will take out more fat than the churn. Buttermilk is liable to have a little larger quantity of butter fat than skimmed milk.

Mr. HELGESEN. Suppose a man is recommended by his doctor to drink buttermilk, do you think if he should drink the buttermilk made from skim milk that he would get the same results?

Mr. RAWL. I think so; yes, sir. Oftentimes he would get better milk.

Mr. ANDERSON. What is the character of your work at Grove City?

Mr. RAWL. At Grove City the community has built a creamery for us and we have leased it. The first floor is a creamery on a commercial basis, operated like an ordinary cooperative creamery in which all the net proceeds are turned back to the farmers; the upper part is a laboratory with facilities for experimental manufacture of butter, condensed milk, and by-products (buttermilk casein, milk sugar, etc.). In our laboratories here we are able to do the thing in a laboratory way, but it is not possible to make these results and these methods safe and practicable without having creamery facilities, and the people at Grove City have built this plant with the understanding that they would lease it to us from year to year, for these purposes. As to the leasing of that plant, our agreement with them was that our rental should constitute, to begin with, 10 per cent of the cost of the building, to be reduced gradually to 6 per cent, and that in lieu of this rental they would maintain, insure, and keep in repair the entire building, including the upper floors which are exclusively for our use, as well as the commercial creamery.

Mr. [illegible]. Have you gone far enough to be able to recommend to the ordinary creamery any machinery or any processes by which these by-products can be used profitably?

Mr. [illegible]. To a degree. In the manufacture of a food product it is desirable to make use of the by-products if possible. In using buttermilk our first question is what food products can be made of it that are marketable. For example, an effort is made to make cottage and Neufchatel cheese from buttermilk. At Grove City all buttermilk is used in the manufacture of cottage cheese. The manufacture of casein is another possible use for buttermilk. The paper makers have never been willing to take buttermilk casein; they use skim-milk casein. We think we have a method by which satisfactory casein for paper coating can be made from buttermilk. I should say that this work is not entirely finished, because we have not run a sufficient number of tests, but I believe it is virtually ready for use for paper making and possibly for some other uses along that line that we are now in a position to suggest.

Mr. Hedrick. What are these caseins used for?

Mr. Rawl. They are used for various purposes, but perhaps the most important use of casein is for paper coating. Our paper makers have never been willing to buy buttermilk casein for coating paper. They use skim-milk casein in large quantities and they pay a good price for it. Casein is also used as chicken feed.

Mr. Hedrick. Tell us why they won't use buttermilk casein.

Mr. Rawl. I can not tell you, sir, other than that the paper manufacturers regard it as unsatisfactory. We think we have entirely gotten around their objections by experiments.

Mr. Hedrick. Is there any other use for it; any other commercial use?

Mr. Rawl. They are using it as chicken feed. It is used in the manufacture of a number of things as a substitute for celluloid, also in the manufacture of glue and paint.

Mr. Howell. Is there any discrimination between buttermilk casein and skim-milk casein where it is used for other purposes than for paper coating?

Mr. Rawl. There is not in such use as chicken feed; but I do not know whether there is in the manufacture of some other things. I can not say about that.

Mr. Wilson. You spoke awhile ago about making milk sugar.

Mr. Rawl. Yes, sir.

Mr. Wilson. I know nothing about that. I do not know whether the other members of the committee do or not, but I should like to hear something about milk sugar.

Mr. Rawl. There is about 5 per cent of sugar in milk. That is the ordinary milk sugar. It is used in various ways, perhaps as much as any other in connection with medicines and that sort of thing. Cheese whey (which is the liquid part after the curd is coagulated) contains virtually all the sugar. This fluid which is drawn off from the coagulated milk—this whey—is used to a considerable extent as feed for hogs, but a great deal of it is wasted; and it contains practically all of this 5 per cent of sugar of the milk.

Mr. Hedrick. Is that the sugar that the homeopathists use in their little pills?

Mr. RAWL. Yes, sir; the same thing. That is the milk sugar that you find in the drug stores. Now, we have no practicable method yet for extracting that sugar for the small plant, and that is one of the things we want to study. This whey containing the milk sugar is thrown into the gutter, often by the thousands of gallons, and, if an economical way could be found to remove it, it could be saved.

Mr. HOWELL. Where does the milk sugar come from that we use now? Is it produced in this country or imported?

Mr. RAWL. I think perhaps a considerable part of it is imported. I do not believe we make anything like as much as we import; but I am not sure on that point.

Mr. MCLAUGHLIN. You are encouraged to believe that you can find a method of making this milk-sugar production profitable, are you?

Mr. RAWL. Yes, sir; we are, although, of course, in such matters we can not be sure in advance. I should say that we hope we may find a method. That is as far as I can go.

Mr. WILSON. Let me ask this question: How much of an appropriation are you asking for this research work?

Mr. RAWL. The entire work that may be classified as strictly research work, including the laboratory work and the work in production and manufacture, will amount to about $70,000.

Mr. WILSON. Then, that $70,000 is for this research work, is it?

Mr. RAWL. For the entire research work proper. It would not necessarily apply, however, to this Beltsville farm, for instance. The operation of the Beltsville farm is indirectly carried on to assist this research work. But $70,000 would cover only the research work itself and not the cost of operating the farm.

Mr. ANDERSON. What is the balance of the appropriation to be used for?

Mr. RAWL. The balance of the appropriation is to be used for dairy farming, $60,600——

Mr. ANDERSON (interposing). Well, do you not consider that investigational work?

Mr. RAWL. Not in a strict sense; in a sense it might be. But we are in the habit of dividing our general work into three classes. I am not speaking for the whole department or for the bureau; but this is about the way our work is organized and what we think of it: One phase is pure research work, for which specially prepared technical men are selected.

Mr. ANDERSON. That is the laboratory work?

Mr. RAWL. Yes; the laboratory work. And that work would include the feeding and breeding of animals—laboratory work in a broad sense.

The second class of work is a sort of go-between; it is the application of the results of the research work to educational purposes. Take the laboratory method for making Roquefort cheese as an example. There are two or three men who have been working on Roquefort cheese for a number of years, and they will establish the methods, if any are established. If those methods are simply published the chances are that no one will make use of them. We must have some one who will go into the field and supervise the application of these methods if they are to be used successfully, and this is

... of the method itself. I ... of ... work ... a semiphilosophical work. The ... educational work. But you can not entirely separate ... work from the educational work, because a man work... ... to-day how he can do it better than he did yester... ... educational work involves work which might ... experimental. I was alluding here to what we might ... work.

... I do not know whether I ought to take the time ... on this question or not, but so far as I am concerned ... willing to have an appropriation for research work ... but I was wondering what kind of men you are ... research work. Are they a high-class set of men, ... salaries, and men that are capable of ... they scientific in their work?

... that question makes me feel a little ... probably Dr. Melvin, the chief of the bureau, ... authority on that question; and he is the one ... judgment as to the character of work that we do.

... will admit that you are underpaid and that you ... [Laughter.]

... I am not doing research work, and I never ... salary.

... (continuing). But how about your assistants, these ...

... Well, we have, on the whole, the best men we can get. ... work is all organized around a problem. Going back ... manufacture of Roquefort cheese, we have in that work two ... the mold side and the bacterial side. We have ... and bacteria, but the mold is one of the essential agents. ... a chemical problem, and the chemical problems which ... the ripening process on the cheese are very delicate and ... We have also the factory side. So we therefore or... ... a biologist, a chemist, and a practical cheese ... the problem from various angles. This is the way all ...

... necessary to do some extremely fundamental ... Swiss cheese work. There you ... conditions to produce ... process. We have been ... and have been obliged ... problems relating to the chemistry ... and the physical properties ...

... parallel lines, because these ... and ... chemists and bacteriologists who ... problems we have, it is necessary to get ... about one of these ... [illegible] ... $5,000 ... start with ... according to their merits until we have ... $5,000 ... In the whole

should consi : our omotion of these men satisfactory. Not all our men are or t b but we have some who are very efficient, and we are endeavoring constantly to raise the standard of efficiency. We are making an effort to conduct this work in the most thorough manner and to bring to it the best skill that we know how to get and to organize the work in the best way we know.

Mr. HELGESEN. I am interested in the Roquefort cheese question, because I am very fond of it; and I should like to ask you how it compares in the way of nutrition and digestibility with other cheese?

Mr. RAWL. It is perhaps a little higher in water content, and it may therefore be a little less nutritious; but on the whole it compares favorably with other cheese.

Mr. HELGESEN. How about digestibility?

Mr. RAWL. So far as I remember at this time, it is about the same as other cheese.

Mr. HELGESEN. I find it much easier to digest.

Mr. RAWL. You find it easier to digest?

Mr. HELGESEN. Yes; I can not eat the other cheese at all; and yet I can eat a considerable amount of Roquefort without any bad effects.

Mr. WILSON. That is merely your personal experience?

Mr. OVERMYER. Different persons having different constitutions would not be affected in the same way.

Mr. RAWL. Yes, sir; different constitutions would handle different substances differently.

The CHAIRMAN. All right; Mr. Rawl, will you take up your next item of work?

Mr. RAWL. I have discussed the increases covering that $22,000; and I will continue and discuss the remainder of the organization of the whole work.

The CHAIRMAN. Very well.

Mr. RAWL. This dairy manufacturing work, which I spoke of here as carrying about $45,370, is our go-between work, I might say. First of all, we have done a certain amount of educational work, and this work has been largely with the creameries, and there is great demand for more. But in addition to having such educational work with a view to the establishment of such better methods as may be possible, we use this work for the inauguration of any new methods which may have been developed by the research workers. At the present time two States have under consideration as a very prominent issue, the whole question of pasteurization of cream. Minnesota and Wisconsin are both considering the passage of compulsory cream-pasteurization acts. The small creameries are asking us more and more for demonstrations or tests to be made to determine whether or not pasteurization is going to affect their business materially.

Mr. WILSON. Right there; do you know anything about the laws of the State of New York in reference to the pasteurization of milk and the pasteurization of butter?

Mr. RAWL. No State has a compulsory pasteurization law applying to the manufacture of butter.

Mr. WILSON. Has not the city of New York an ordinance on the subject?

Mr. RAWL. The city of New York—Dr. Melvin will correct me if I am wrong—has an ordinance requiring that milk of certain definite

grades shall be sold there. One grade requires pasteurization. A superior grade—that is, a grade of certified milk produced from tuberculin-tested cattle—is permitted to be sold without pasteurization; but their pasteurization law would cover a very large percentage of the milk consumed.

Dr. MELVIN. That is, the city of New York only.

Mr. WILSON. Is that not also true of the butter that is sold in New York City?

Mr. RAWL. No, sir; I think not.

Dr. MELVIN. No.

Mr. RAWL. So far as I know, no State has a compulsory pasteurization law for butter.

Mr. WILSON. Well, I notice in some of the advertisements that they are using that statement.

Mr. RAWL. Yes, sir; a good many. I think 10 per cent of the creameries in Minnesota and Wisconsin pasteurize the cream——

Mr. HAUGEN (interposing). Is not the practice of pasteurization being discontinued in the creameries quite generally?

Mr. RAWL. No, sir.

Mr. HAUGEN. It is in our section.

Mr. WILSON. Should it not be encouraged?

Mr. RAWL. Yes, sir.

Mr. HAUGEN. Can you give the reason why it should be encouraged? I am anxious to know that.

Mr. RAWL. First, because it stabilizes the method of manufacturing butter. Cream that is brought together from various sources has in it various sorts of bacteria. Take the lactic-acid group; there are perhaps hundreds of species, some of which may be undesirable. If they pasteurize and destroy all of these bacteria and put back a pure culture—a "starter," as the creameries call it—then they utilize the particular organisms that make the finest flavor.

That is the first consideration. No butter maker can under general conditions make a permanently uniform grade of butter without pasteurization. If he can control the production, have it all produced in exactly the right way, then he can make a uniform grade.

In the second place, it is not practicable without pasteurization to handle milk in such a way that butter made from the cream will be absolutely free from infection by disease bacteria.

Mr. WILSON. Without pasteurization?

Mr. RAWL. Yes; without pasteurization. We have done some extensive work on the cost of pasteurization and found it to be in the case of cream about $0.00084 per gallon and for milk $0.00313 per gallon when everything is done in the best way. The cost of pasteurization is a very small expense, and we believe firmly that the pasteurization of cream for butter making is a thing to be very much desired.

Mr. HAUGEN. I understand that you are carrying on some experimental work now to determine the effect of pasteurization, boiling, sterilization and so on, on the food value of milk. Has it been determined that pasteurization is the best method, looking at it purely from the standpoint of food value?

Mr. RAWL. I was speaking of the pasteurization of cream for butter making. In order that I may not be misunderstood, I will [illegible] do not yet know how to make a good many types of

ese out of pasteurized milk. Pasteurization can not be used in manufacture of all dairy products.

The question of market milk is a different phase of the subject; question of determining food values belongs primarily in another nch of the department. We have been studying pasteurization l its effects for several years, however, and we have found that lk pasteurized according to the best known methods, which olves heating to the lowest posible temperature that will accomsh the purpose, or about 145° for 30 minutes——

Mr. LEE (interposing). How expensive is this pasteurizing proc-s? Can you tell us?

Mr. RAWL. In commercial plants the cost of pasteurizing milk approximately $0.00313 per gallon, and cream $0.00634 per gallon.

Mr. OVERMYER. This may be somewhat aside from the subject, t do you know of a process by which butter can be rendered back to cream?

Mr. RAWL. Yes, sir; it can be rendered back; but, if you will cuse me, there are two points I should like to cover before I forget em.

Mr. OVERMYER. Certainly.

Mr. RAWL. Milk can always be pasteurized at home at no material st. This is done by placing a bottle of milk in hot water and heatg the milk to 145° F. and holding it at that temperature for minutes. Anybody can do this.

Mr. HAUGEN. Does that milk retain the same flavor after pasteurtion; is it more, or less, palatable?

Mr. RAWL. That is what I was coming to. The old method of steurization, where milk was heated to 165 degrees, did give it a rked cooked taste; it also affected the chemical composition. ne more recent methods, whereby the milk is heated to 145° and ld for 30 minutes instead of being heated to one hundred and nty-odd degrees, does not perceptibly affect the flavor. The holdg process brings about the destruction of the pathogenic organns; it does not produce a cooked taste, and it reduces the chemical ange to an extent almost beyond the power of chemistry to deterine. There is possibly a very slight chemical change in the milk, t it is insignificant in importance.

Mr. HAUGEN. Does that also apply to butter?

Mr. RAWL. The flavor of butter?

Mr. HAUGEN. Yes.

Mr. RAWL. No, sir. The flavor in milk, of course, is——

Mr. HAUGEN (interposing). There is a wide difference of opinion to the effect of the pasteurization on milk.

Mr. RAWL. I know it.

Mr. HAUGEN. And I would like to know from you exactly what, your opinion, is the effect of pasteurization on butter and on ilk also.

Mr. RAWL. As I was just saying, with the low temperature and the olding process now used, the flavor of milk is not perceptibly fected.

Mr. HAUGEN. Then, that result is due to this new process?

Mr. RAWL. Oh, yes; I would not recommend the old process of steurizing milk.

Mr. HAUGEN. When you speak of the old process, what time do you have reference to—five years ago, three years ago, or what time?

Mr. RAWL. About four or five years ago.

Mr. HAUGEN. There have been some new discoveries along that line in the last few years?

Mr. RAWL. Yes; the methods have been gradually improving. Originally, the first method was practiced, which consists of momentarily heating and momentarily cooling.

Mr. HAUGEN. Now, you might explain about the new process, and how you get the results desired, as you have indicated here.

Mr. RAWL. Well, the milk is simply heated to 145° and run into a tank, where it is held at that temperature for 30 minutes.

Mr. HAUGEN. The old process, what was that?

Mr. RAWL. In the old process, there was no tank. The milk was carried direct from the heater to the cooler.

Mr. HAUGEN. And the temperature?

Mr. RAWL. In the new process?

Mr. HAUGEN. The new process and the old.

Mr. RAWL. In the old process the temperature was one hundred and sixty-odd to 165°, and the milk ran from the heater right into the cooler. In the new process it is heated to 145°; and it runs from the heater into the holder, a tank, where it is held for 30 minutes, and then run into the cooler. But even this method of cooling we think will be changed somewhat in the near future.

Mr. WILSON. Does that pasteurization destroy all germs?

Mr. RAWL. No, sir.

Mr. WILSON. It does not?

Mr. RAWL. Not absolutely.

Mr. MCLAUGHLIN. It destroys all harmful germs, does it not?

Mr. RAWL. This temperature is maintained to destroy all pathogenic organisms, and in practice it will accomplish practically that end. Now, of course, I am not a pathologist, and I am not speaking from the standpoint of a trained pathologist: Dr. Mohler and Dr. Melvin are here, who can speak with authority on that; but that is the determining factor in the adjustment of temperatures—to maintain a temperature that will destroy the pathogenic organisms. This pasteurization will destroy over 99 per cent of all organisms present.

Mr. WILSON. Have you ever considered the advisability of having tuberculin tests made at all creameries and of the cows at the places that supply the different creameries in the country?

Mr. RAWL. Yes, sir.

Mr. HAUGEN. If you do not mind, Mr. Wilson, will you let Mr. Rawl go on with his explanation of the different processes of pasteurization before answering your question, so as to get all that in one place in the record?

Mr. WILSON. Yes; certainly.

Mr. RAWL. You asked me about the pasteurization of butter?

Mr. HAUGEN. Yes; and especially the later process.

Mr. RAWL. I got through with that, as far as it applies to milk; but if you want something further with regard to the effect on the flavor of butter—

Mr. HAUGEN (interposing). I would like to have all that information in the record, so that I can refer to it those people who are interested in the matter.

Mr. RAWL. As to the pasteurization of butter, we must consider that butter is made largely from the fat of milk.

Mr. HAUGEN. Yes.

Mr. RAWL. I do not know just exactly what element it is that acquires the burnt taste in milk that has been improperly pasteurized, but the fat is not nearly so susceptible to the application of heat as are the other constituents of the milk. As good butter contains less than 1 per cent of casein and only traces of the milk constituents other than fat, it follows that, with proper methods, good butter should not show any effect whatever in taste from pasteurization.

Mr. OVERMYER. Is it not true that butter fat is always pure; that no matter how rancid the butter may be or how fresh it may be, the butter fat itself is always a pure product, and that the odors pertaining to rancid butter are due to the other particles in it—the casein, whey, and so on?

Mr. RAWL. Well, the whole question of what is pure——

Mr. OVERMYER (interposing). Are not the butter-fat particles themselves always pure?

Mr. RAWL. No, sir. Now, I am not qualified as a chemist to speak on this point, and I can give only my own opinion. There are, however, certain chemical changes that take place in butter—and this brings in some very intricate and delicate problems in chemistry; for instance, the fatty acids increase very much—but butter fat is much less liable to be affected, apparently, than curd or the casein. Therefore, in making good butter the aim is to get all of the curd out of it, if possible.

Mr. WILSON. Right there, let me say that I have understood that some of the creameries in the country accumulate a lot of old cream, or stale cream—it may be for several weeks, or even months, that it accumulates—and then they doctor it to such an extent that they have removed all of this rancid taste, etc.

Mr. RAWL. No, sir; they do not remove it all, but they remove most of it——

Mr. WILSON (interposing). I know; but are you familiar with that process and that practice? If you are, I think it would be interesting to this committee for you to tell us something about that, and how extensively the practice is carried on in this country.

Mr. RAWL. That leads into a big phase of the creamery business. The thing that you are speaking of is known as the centralized creamery, which sometimes ships cream a very long distance. They very often receive cream that is several days old. As to the extreme time which it is held, I do not know, but sometimes it is held for a considerable period, and then it is assembled and shipped for a long distance. It may run up in some cases to several hundred miles.

Mr. MCLAUGHLIN. Shipped as cream?

Mr. RAWL. As cream; yes, sir.

Mr. HAUGEN. Well, is that in creameries or is that in process work—manufactured process?

Mr. RAWL. In creameries. Process butter is the old butter made over.

Mr. HAUGEN. I understand; but you say this is in creameries?

Mr. RAWL. This is in creameries.

[illegible] they get [illegible] per- [illegible] centage. [illegible] going to [illegible] they [illegible] it. [illegible] then [illegible] had [illegible] it is [illegible] pasteurize it; [illegible] I understand that some of them aerate the cream by blowing air through it for a time. They pasteurize at high temperatures, then use very large starters and proceed in the ordinary way.

Mr. Wilson. Do they put that sour cream—this rancid cream, as you call it—with the sweet cream? Do they put it all together?

Mr. Rawl. Their methods perhaps would differ. Some would grade it; some of them will go beyond a certain quality. I do not know that there is an absolutely uniform method as to that. Some maintain two grades of butter; they use the better cream for the better butter and the poorer grades of cream for their poorer butter. I do not think, however, that there is any absolute uniformity as to how they handle this bad cream; they handle it in such ways as to get the most out of it.

The Chairman. It is almost time for us to adjourn and, if the members of the committee have completed their inquiries along that line, I would like to ask Mr. Rawl to summarize the work he is doing under this appropriation.

Mr. Rawl. There are just one or two other questions I should like to touch upon, if I may have a few minutes.

The Chairman. Certainly.

Mr. Rawl. Taking up now what we call the market-milk work, I have said that that deals with the milk problems of the cities and is largely a question of how to get better milk to them. This work is related in a practical way to the whole question of getting good milk to the consumers at a reasonable price. Our men in this work go to the various cities and remain for a period of time to find out the exact conditions. I may say that we have no authority in this connection to work as agents for the enforcement of law, but we are doing this work in an educational capacity and at the request of the city officials. We are working with them in improving their methods and their methods of inspecting the farm dairies and the [illegible]

[illegible] Is there a large demand for that work?

Mr. Rawl. There is a much larger demand for it than we have [illegible] to supply, but many places where the milk is bad the [illegible] improving it is not yet realized.

Mr. [illegible] Mr. Rawl, you were saying a moment ago that [illegible] to develop conditions whereby it would be certain that [illegible] of the milk would get a price that he could afford to [illegible]

Mr. Rawl. Yes, sir.

Mr. HELGESEN. Do you mean that you are able to tell what proportion of the retail price the milk producers—the farmers—get here Washington or in any other city?

Mr. RAWL. Yes; on an average, they get from 48 to 53 per cent of at is actually the retail price.

Mr. HELGESEN. From 48 to 53 per cent?

Mr. RAWL. Yes, sir; if you consider the country as a whole, the mer gets about 50 per cent of what you pay for milk wherever go.

The CHAIRMAN. About 50 per cent?

Mr. RAWL. Yes, sir.

Mr. HAUGEN. Then, the cost of distribution is about half the ail price?

Mr. RAWL. The cost of distribution is about half, and the farmer to sell his milk at what he can get for it——

Mr. HELGESEN (interposing). I was told just recently that the mers usually get 4 cents a quart, and here in Washington they 4½ cents, and yet that milk is sold for 9 or 10 cents when they tribute it. I should think that the distributor ought to pay a t of this difference to the producer if there is any way to make a do it.

Mr. RAWL. The distributor, of course, occupies a position that is re advantageous to him than is the position occupied by the mer, because the distributor takes the milk of a hundred or housand farmers, and he says he can handle it at only such a ce and he can get such a price for it, and he pays the farmer ordingly.

Mr. RUBEY. Can not that system be remedied?

Mr. RAWL. Well, possibly it comes along in a similar class with ny of our other economic problems; and the position that we have en in regard to this work has been that we must expect the pub-, and the health officials, and all who are interested in good milk, look at the question from both standpoints—not only what it can produced for, but——

Mr. STEELE (interposing). I am greatly interested in this cream d butter and cheese manufacturing, and I should like to ask this: it your idea to go into a community, with men from your division, d establish creameries?

Mr. RAWL. No, sir.

Mr. STEELE. Here is the idea that I wanted the committee to take some time: That creameries and milk plants should be established these different western countries, such as the doctor has suggested. d especially upon these projects of conservation which the Governnt has established in the way of irrigation projects. I am parularly familiar with the Belle Fourche project, and through the ucational activities of the Agricultural Department my friends ve gone out there; and you have not carried out that project, to my nd, as fully as you ought to, and you have pauperized many of our ir friends. In other words, you have said that 80 acres of land s his homestead; you have educated him to raise alfalfa and the ferent grains for that particular place, and he has done so. He has ne out loyally and undertaken to take this homestead and pay to Government $40 per acre for the water rights.

As I say, they have produced these crops; and ranchmen have come down into that particular place, that valley, and purchased a crop of alfalfa at $8 a ton, at which price no man can make any living on 80 acres of land.

Now, this question may come up in connection with the rural-credits legislation; but I will say that the Government should have protected those young men, and given to them some resources in the way of selling them 10 or 15 cows and locating creameries at that place in a sort of cooperative community interest. If the Government had done that, you could have had those men occupying those lands and paying this great debt that will have to be paid to the Government.

So that at the proper time, I should like to have that kept in mind by the members of the committee. Now, the Agricultural Department as I understand, has sent out experts telling those young men how to make hay cheaply, which seems to me entirely useless, because those men know how to make hay, and they have done so. But, you understand (I have been in touch with that feature of it for years), the man this boy of yours, who has gone there to that reclamation project can not pay for these cattle in six months or a year. He must have a community bull. He can not afford to keep a bull costing about $150 for his one little farm. It takes five or six years to work out his obligations, in order that he can make a living upon this place. I do not know whether you catch my thought or not?

Mr. RAKER. Yes, sir.

Mr. STEELE. Now, there is a wide field to work upon. I do know that out west of the Missouri River we men went out and sold cattle by hundreds and thousands of head, on time—stock cattle and steers—and we practically wrecked those fellows; but later, through the encouragement of the Agricultural Department, they have gone to work getting a few cows where they could, here and there, and paying for them later; but the "milk tickets" for that country are keeping these boys upon those lands.

The CHAIRMAN. Mr. Steele, if you will permit me a suggestion, there is an item later in the bill carrying an estimate of $87,500 for taking up the line of work that you are suggesting. It was recommended last year by the Department of Agriculture and disallowed by the committee. It has been reestimated for this year, and is found in the back part of the Estimate Book. We can discuss that item when we get to it in the hearings.

Mr. STEELE. All right, Mr. Chairman.

Mr. RAKER. I should like to add a word, Mr. Chairman, so that I may not be misunderstood. I said that we did not maintain a work of organizing these creameries. Now, we do deal with this problem, so far as our facilities will permit, along a rather conservative line. We have worked with a number of creameries in those reclamation projects, with the idea of putting them on their feet. Whenever our people are asked to advise regarding the establishment of a new creamery we give that advice. If a creamery is going to be built in a region where there is danger of its being unsuccessful we would advise to that effect.

But we do not assume the responsibility of going out and conducting a campaign for the organization of creameries, because we should

feel that the failure of any of those creameries for whose establishment we were partly responsible would do our work harm; and we are trying to approach the problem as rapidly as we can and as rapidly as our facilities will permit, by working with the creameries that are already established and by giving such aid as we can to those that are proposed, in the way of counsel, helping to organize them properly and helping to systematize their work. In that sense we are doing what we can to aid those creameries.

The CHAIRMAN. Now, Mr. Rawl, if you will summarize your lines of work briefly for the record I will be very much obliged to you.

Mr. WILSON. I would like, first, to ask one question, though I do not know that Mr. Rawl is the one in charge of the work. I would like to have your opinion, Mr. Rawl, as to the advisability of having a tuberculin test made in all creameries and herds.

Mr. RAWL. Yes. I did not answer that question quite fully a while ago, I believe.

Mr. WINSLOW. I know you did not, because you were finishing on another question; and I do not know whether some representative of the department will follow you who will be able to take up this subject or whether it comes within the scope of your duties.

Mr. RAWL. Yes. From the creamery standpoint we have considered that a number of times with the idea of making certified butter from tuberculin-tested cows, just as is now being done with milk. There may be a few creameries operating on this basis. The State of Minnesota has passed a law giving some recognition to a creamery that has done that sort of thing. How many such creameries there are I do not know, but not a great number.

The difficulty about that will be, unless it is accompanied by some provision for disposing of the cattle affected, that the cost will add something to the cost of every pound of butter sold. But we believe that the tuberculin test ought to be encouraged and ought to be pushed along wherever possible.

Butter does not carry a great amount of tuberculosis bacilli. That has been, I think, pretty well demonstrated. But it may carry some; and pasteurization will safeguard that. It is not absolutely essential, therefore, for the safety of butter that the cattle be tuberculin tested. But it would be an economical thing for the farmers. No farmer can possibly afford to have tuberculosis in his herd. It saps the vitality of the herd, impairs its efficiency, and it injures the sale of the animals. So there are a great many reasons why this tuberculin testing should be done, although it is not absolutely essential to the sanitary quality of the butter in view of the fact that pasteurization will accomplish the same end in that regard.

Mr. HELGESEN. After all, those are State problems, how to deal with that—I mean so far as the law is concerned? It could be handled according to the same plan as the meat inspection. As I understand, the Federal Government could not deal with it except when the product goes into interstate commerce, the same as in the case of the meat products.

The CHAIRMAN. All right; you may proceed with your summary, Mr. Rawl.

Mr. RAWL. Reviewing briefly our work—that is, its main subdivisions—there is the administrative work, looking after the general

executive side of the dairy farming, which deals with the questions of production and is done largely as "half-and-half" work, as we call it—that is, wherever we have a man working as a dairy specialist in a particular State the State pays part of the expenses of keeping the man there. Then there is the dairy manufacturing work, which deals with the manufacturing problems on a similar basis; the market-milk work, which deals with the city milk supplies; the dairy research laboratories, devoted to the investigations of all kinds of dairy problems; the western office, which covers all three branches—the market-milk, the manufacture, and the production features; and, finally, the farm at Beltsville, which is maintained to deal with the problems of breeding, milk secretion, and other phases of production work.

That gives a general review, Mr. Chairman.

The CHAIRMAN. Are there any further questions, gentlemen, that you wish to ask Dr. Rawl?

Mr. MCLAUGHLIN. You spoke of one particular line of work that you think would be very valuable, and said that there is urgent demand being made for it and that there is very great need for it, but you have not recommended an increase of the amount of money necessary to carry on that work. What particular appropriation provides for that work?

Mr. RAWL. Just which phase of the work do you mean?

Mr. MCLAUGHLIN. Well, it was when you were speaking of the city marketing.

Mr. RAWL. Yes; that was the market-milk work. There is $5,000 included in this estimate, at the top of page 42.

Mr. MCLAUGHLIN. I ask that question because the committee, in its wisdom or otherwise, may feel it necessary to reduce some of these estimates, and we want to know something about the relative importance of them; and we certainly do not want to reduce any appropriation for which there is such urgent need as you suggest. Now, which item is that?

Mr. RAWL. That is at the top of page 42, and is explained under note (*d*).

The CHAIRMAN. You would use $5,000 of that $22,620 increase for that purpose?

Mr. RAWL. For that purpose; yes, sir; I neglected to explain both those items at the top of page 42; I forgot to turn the page. Also $4,880 for experimental work in breeding and feeding dairy cattle.

Mr. MCLAUGHLIN. You think that the work of that kind could very well be extended if money could be spared for it?

Mr. RAWL. Yes, sir.

Mr. HAUGEN. How long have you worked on that proposition of the marketing of milk?

Mr. RAWL. We have not worked on the marketing phase of it, but principally on the methods involved in the whole question of producing and handling market milk.

Mr. HAUGEN. I understood you to say that that was one of the most important projects that you had in mind?

Dr. MELVIN. This class of milk is known as "market milk."

Mr. HAUGEN. I understood it to apply to the marketing of milk; that you had given a good deal of attention to that, and that a con-

siderable amount of money had been spent. For how long a period have you been working along the lines you mention of dealing with milk; and how much have you spent?

Mr. RAWL. We have worked about seven or eight years on that work and have spent about $10,000 a year on it.

Mr. HAUGEN. Up to the present time, what have you been able to suggest along that line that might eliminate certain expenses in dealing with milk?

Mr. RAWL. I can not give you the number of cities that we have worked with, but we have worked in a large number. For instance, last year one of the cities that we worked with was Johnstown, Pa. And before I forget I want to make it plain that this work, which we call "market milk" work, is not primarily marketing. Market milk is the name of milk that is drunk as milk; it is just a commercial term; and we use the same term. But our work relates to the whole question of handling it, the whole question of bottling it, and distributing it, its pasteurization, and the inspection systems also.

In Johnstown we made a survey of the milk at the request and invitation of the city. Then, after the facts were all gotten together, we suggested certain definite changes.

Mr. HAUGEN. Will you state for the committee the suggestions that you made that would benefit the producers of the milk?

Mr. RAWL. Those suggestions would vary in different cities, but those that we regard as the most vital are that milk that does not come from tuberculin-tested cattle should be pasteurized, and the pasteurizing plants should be systematically inspected to make sure that the pasteurization is efficient, and that milk be required to be produced and handled under reasonably sanitary conditions.

Mr. HAUGEN. Do you suggest a central depot, then?

Mr. RAWL. No, sir; that is a question for each city to decide.

Mr. HAUGEN. Well, you spoke of supervision by whom?

Mr. RAWL. By the city or the State health department. With regard to the question of a central plant, that brings up the economical question of whether Washington, for instance, ought to have one milk plant or a dozen.

Mr. HAUGEN (interposing). Now, what have you suggested about the delivery?

Mr. RAWL. The custom varies so greatly in different cities that it is difficult to answer that. Some cities have two deliveries a day; others have only one. And the various phases of delivery would depend on local conditions.

Mr. HAUGEN. Would you suggest the bottling of the milk, icing, etc.?

Mr. RAWL. Bottling? Not absolutely. We suggest bottling for milk that is used for drinking purposes, particularly for children and for hospitals; but for cooking purposes, for restaurants, etc., it may be used in bulk, but it should be kept at certain temperatures. Milk should be delivered, handled, and kept, even in the house, at a proper temperature; and it should not be allowed to stand in the sun for two or three hours after it is delivered. Those are the principal things, the fundamentals, that we are trying to have established. We are trying to get the cities themselves, their boards of health, their systems of inspection, etc., to deal effectively with these questions.

Mr. [illegible] I suggest that we incorporate a statement in the record of these hearings showing exactly the suggestions you have made as to the handling of milk so that the public may have the benefit of your experience and the knowledge you have acquired in your work.

Mr. Rawl. Yes sir. I may do that before perhaps, by reference to certain bulletins that have been issued dealing these various matters.

Mr. [illegible] I would like to have that incorporated right in one connected statement so that those who read the record may have the benefit of your knowledge on the subject.

Mr. Rawl. Yes sir.

The statement referred to follows:

STATEMENT OF DR. W. D. RAWL IN DEALING WITH THE SANITATION OF A CITY'S MILK SUPPLY.

The Department of Agriculture in working with State and municipal officials for the improvement of milk sanitation urges that ordinances relating to the dairy industry should be more nearly understandable and uniform. Diversity of laws has led to considerable misunderstanding among dairymen and has been the cause of considerable needless trouble. Another thing that the department urges is that dairy inspectors be selected who are fitted for this particular line of work. Many cities have inexperienced and unqualified men who have, through a misunderstanding of the problems involved, unnecessarily increased the burden of the milk producer, and in this way have hampered the work of good milk. Dairy inspectors should be familiar with farm products so that they can meet the farmers on their own ground and help them with their sanitary problems as well as with the improvement of sanitary conditions. The department employees endeavor to aid the State and municipal dairy inspectors in adopting a uniform system of inspection whereby the greatest good can be accomplished with the minimum delay on the part of the farmer. Inspectors are urged to pay particular attention to the health and cleanliness of the cattle, the use of a covered milk pail to exclude dirt, the prompt and efficient cooling of milk and the proper sterilization of all vessels with which milk comes in contact. At the plant of the city dairy inspectors are asked to use a uniform method of inspection and are urged to pay particular attention to the cleanliness of the building, the proper sterilization of all apparatus, the physical condition of employees, the promptness with which milk is handled, its protection from contamination, and proper methods of pasteurization.

The Chairman. Does that complete your statement, Mr. Rawl?

Mr. Rawl. I think that completes the statement. I reviewed the whole line of our activities a moment ago and will insert the figures in the proper places.

The Chairman. I call the attention of the members of the committee to pages 44 to 50 of the book entitled "Program of Work of the United States Department of Agriculture for the Fiscal Year 1916," which gives a detailed description of the work Mr. Rawl is doing. I think it would be very well for us to read that.

Mr. Haugen. One other question. What project are you now paying special attention to in your division?

Mr. Rawl. I should say we are paying special attention to each of these essential items; each of these different lines that I have referred to.

Mr. Haugen. You think one as important as another?

Mr. Rawl. Well, not absolutely.

Mr. Haugen (interposing). What one do you deem the most [illegible]?

Mr. RAWL. Perhaps the research work. The acquiring of more definite knowledge as to dealing with these various problems is the class of work that is as essential as if it is not more so, than the others. Of course, the educational work is very important, too, but there are more people doing that.

Mr. HAUGEN. How is that demonstration work carried on? Is that carried on through the general agents——

Mr. RAWL (interposing). Yes, sir; where we have any work in a State——

Mr. HAUGEN. When I speak of agents, I have reference to all the agents of the department. In other words, is there cooperation between your division and the other divisions of your department?

Mr. RAWL. Yes, sir. Of course, where there is reason for two divisions of the department to cooperate, we do so whether it is in the same bureau or in different bureaus. But whenever we have men regularly stationed in a State as leaders, or specialists along some of these lines, those men are paid partly by the State; they are part of the State's system as well as of ours, dealing with such dairy work as may relate to that State's interest.

Mr. HAUGEN. Well, an effort is being made then to avoid duplication of work?

Mr. RAWL. Absolutely; yes, sir.

Mr. HAUGEN. So that these various divisions and bureaus of the department are cooperating in their work?

Mr. RAWL. Yes, sir.

The CHAIRMAN. I am glad that you have brought that out, Mr. Haugen.

Gentlemen, we will meet to-morrow morning at 10 o'clock, to continue the hearing on the Bureau of Animal Industry

(Thereupon, at 12.20 o'clock p. m., the committee took a recess until Wednesday, January 12, 1916, at 10 o'clock a. m.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Wednesday, January 12, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

STATEMENT OF DR. A. D. MELVIN, CHIEF OF THE BUREAU OF ANIMAL INDUSTRY—Continued.

The CHAIRMAN. We will turn to page 40 of the estimates, gentlemen, and I will ask Dr. Melvin to take up item 53. I wish you would take each line of work, Dr. Melvin, that you have under that item and give a brief description of what you are doing, what you have been doing, and what you contemplate doing in the immediate future on these lines of work with the appropriation you are asking for. You understand we want this in such order that it can be easily referred to in the hearings from time to time.

First of all, in that item would be your expenses for the eradication of scabies in sheep and cattle. Will you give us the amount you are spending for that, and tell us something of the methods you are using and what progress you are making? I think that would be very valuable to the committee. That is on page 40, item 53, in the Book of Estimates.

Dr. MELVIN. This total amount is divided into a number of subheadings. The important work under this has been the interstate transportation of live stock; the eradication of sheep scab; the eradication of cattle scab; the inspection and tuberculin testing of cattle; the mallein testing of horses for interstate shipment; the eradication of tuberculosis among dairy cattle; the manufacture and distribution of mallein and tuberculin; the control of glanders; manufacture and distribution of blackleg vaccine; the investigation and chemical testing of dips and disinfectants—that is, dips used in scabies eradication—supervision and inspection and quarantine of imported animals from across the seas, Mexico, and Canada; quarantine of animals at ports of entry; investigation of the importation of hides, hay, forage, and similar products; inspection and testing of animals for export to foreign countries; enforcement of the 28-hour law; investigation of vessels carrying export animals; and administration, stores, etc.

One of the largest items is the interstate transportation of live stock, which consists in supervising and inspecting live stock shipped from the large live-stock centers in interstate traffic. That is to insure against carrying contagious diseases from one State to another

Eradication of sheep scabies is the largest in size, as to money spent. The work has been pursued for a number of years, and we have now reduced the infection to a very small amount. There is some infection, however, existing in many of the centers where it was formerly very prevalent; and while the expense has been reduced materially, the work requires considerable supervision, in order finally to effect a complete eradication of the disease. This work is carried on principally in the Western States—in Colorado, New Mexico, California, Nevada, Utah, and those intermountain States.

Three years ago we took up the eradication of sheep scab in Kentucky, which was quite prevalent there at that time, and we completed that work in about 18 months. Then we have carried on some work in Tennessee and, I think, have completed the eradication there. But in both of those States the number of sheep was small as compared with those Western States.

The CHAIRMAN. What is the nature of that disease?

Dr. MELVIN. It is due to a parasite, and is analogous to the itch in man; the spread of this parasite being by contact with the animals, or by inhabiting the same bed ground, or in other similar ways. The remedy is to dip the animals in an effective dip and disinfect these bed grounds, or destroy them, where they have infected.

The CHAIRMAN. The disease is something on the order of mange in dogs, is it not?

Dr. MELVIN. Yes, sir; it is very similar. Each species of animals has its own mite or parasite that is peculiar to that species; cattle have their own; sheep have their own, and dogs have their own species, but the are all very similar.

The CHAIRMAN. What is your dip, an arsenic dip?

Dr. MELVIN. Principally, for these diseases, it is lime and sulphur, or tobacco. The arsenic dip is used almost entirely for cattle in the eradication of the tick.

Mr. HOWELL. What is your method of operating for the cure of scabies?

Dr. MELVIN. In the open-range country, where it is determined that the disease is more or less prevalent, all animals in that section are required to be dipped in these preparations, irrespective of whether or not they may be actually diseased, because, working on such a large scale, it is impossible to always demonstrate the presence of that tick mite in very slightly infected animals; so, to make sure that none escape, all animals are dipped once or twice, and occasionally three time, in order to——

Mr. HOWELL (interposing). In one year?

Dr. MELVIN. In one year; yes. The more frequent dippings are in the case of bucks, which are very hard to cure. They are frequently dipped three and sometimes four times in order to make sure.

The CHAIRMAN. Do you have a vat for that, as you do in cattle-tick dips?

Dr. MELVIN. Yes; and this vat is generally very much longer, so that it requires a longer time for the animals to pass through; it is aimed to keep the animals in the solution from one to two minutes, so as to insure the penetration of the dip through the fleece.

The CHAIRMAN. What progress have you made with that line of work? You have been doing it a good long while, I understood you to say a moment ago.

Dr. MELVIN. I have not exact figures with me.

The CHAIRMAN. Well, we want simply a general statement.

Dr. MELVIN (continuing). I can not give you figures showing just the extent of the progress we have made, but I should say, so far as the number of diseased animals is concerned, that it has been reduced probably 90 or 95 per cent. As I said a moment ago, there is some slight infection remaining in almost all of these centers, so that it requires supervision at present in order to make sure that eradication is finally completed.

Mr. HOWELL. Do you find a hearty cooperation on the part of flockmasters with your efforts to eradicate this disease?

Dr. MELVIN. As a general proposition we do; especially now, since the majority of the flockmasters have their herds clean; and, of course, they are very anxious that the disease be completely eradicated so that their flocks will not become reinfected.

The CHAIRMAN. How much weight does a sheep lose on account of this mite or scab?

Dr. MELVIN. That varies a great deal, according to the extent of the infection. Frequently animals will become very much reduced in flesh, and even half of their fleece will be gone; that would be in extreme cases. The loss in wool and in flesh, I should say, in badly infected flocks would amount to possibly 35 to 40 per cent.

The CHAIRMAN. Have you any figures which would show the money loss annually in this country due to diseases of animals over which your bureau has control? I have seen statements of that kind, and I am wondering whether or not they were authentic.

Dr. MELVIN. They are largely estimates, and necessarily so.

The CHAIRMAN. I understand that.

Dr. MELVIN. In the Secretary's report for this present year he has made a statement showing the approximate losses from these various diseases.

The CHAIRMAN. It runs up in the hundreds of millions of dollars, about $919,000,000, I understand?

Dr. MELVIN. I think that is the figure; yes, sir.

The CHAIRMAN. How much money are you now spending on this sheep scab work?

Dr. MELVIN. For sheep scabies, $118,930, and for cattle scabies, $60,170. Cattle scabies is not as generally disseminated as sheep scab.

The CHAIRMAN. Is it the same parasite in sheep as in cattle?

Dr. MELVIN. It is similar; it is a different species, however; one is peculiar to cattle and the other to sheep.

The CHAIRMAN. It affects the animal in the same general way, however?

Dr. MELVIN. Yes, sir.

Mr. HAWLEY. Most of this money is expended for personal services and traveling expenses, I suppose?

Dr. MELVIN. Practically all of it. The owners of the animals build the dipping vats and furnish the dip, and our expenditures are, as you say, in salary and traveling expenses—in supervision.

The CHAIRMAN. The flockmaster furnishes the dip, did you say?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Is there anything further on that item?

Mr. ANDERSON. I understand that you have transferred to that item the item for dourine, Dr. Melvin?

Dr. MELVIN. It is proposed to do that for the coming year.

Mr. ANDERSON. Well, if that is done, the question that I want to ask is, Would that make the appropriation for dourine subject to use for any other purpose? What I have in mind is this: This in a general provision here, which includes a number of subjects.

Dr. MELVIN. Yes, sir.

Mr. ANDERSON. And if the dourine item was included in this paragraph the amount which has heretofore been appropriated for dourine would also be subject to be used for the purposes specified in this provision.

Dr. MELVIN. Yes; it would, just the same as scab or any of these other objects that we have in mind. It is our purpose, however, to set aside out of this amount $75,000 to be used entirely for dourine without having the committee make a specific appropriation of that sum.

Mr. ANDERSON. That is the specific statement I wanted to get into the record.

Mr. HAWLEY. Under what language in item 53 would you take care of the dourine work? The language does not appear to have been changed.

Dr. MELVIN. No; but there is sufficient general authority under item 52 for dealing with contagious diseases in general so as to include dourine.

Mr. HAWLEY. Yes; but the appropriation is carried under item 53. Would it not need some specific language in there to enable you to use the funds appropriated in that paragraph for the dourine work?

Mr. MCLAUGHLIN. Just what language in item 53 would authorize you to use that money for dourine work?

Mr. HOWELL. The last two lines.

The CHAIRMAN. The language where it says "inspection work relative to the existence of contagious diseases."

Mr. HAWLEY. But they go further than inspection. You actually doctor the horses, do you not?

Dr. MELVIN. Usually the horses are destroyed; so far we have found it an incurable disease. Young stallions are quite frequently castrated and used for work animals.

Mr. ANDERSON. Is any part of the cost of the experiments which you are carrying on at Bethesda as to dourine paid out of this $75,000, can you state?

Dr. MELVIN. Yes; a small sum was paid out for some horses sent in from Montana for experimental purposes.

The CHAIRMAN. I would like to suggest, before we discuss the dourine item, that I would rather have Dr. Melvin take these items up in the order which they occur in the Book of Estimates.

Mr. HAWLEY. I was just going to ask whether the dourine item appears later in the bill, or does it appear only in this item?

The CHAIRMAN. It is mentioned in this item; but I think it is discussed in a later paragraph of these estimates, is it not, Dr. Melvin?

Dr. MELVIN. Yes, sir. It was carried the present year and the previous year under the hog-cholera item; now we propose dropping it

Dr. MELVIN. We have to rely on the owner to observe the restrictions which the State veterinarian has placed on the use of the stallions.

Mr. HAWLEY. Have you found any cases where they have not observed the restrictions?

Dr. MELVIN. No such case has come to my attention.

Mr. MCLAUGHLIN. You speak of the restrictions that the State veterinarian fixes. He does take charge of these animals, then, and oversee them in such a way that he knows that they will not be used?

Dr. MELVIN. Oh, yes; there is no incentive for the owner to use the stallion in the meantime, because he is very anxious to get rid of this disease; he is the one most interested in getting rid of it, because——

Mr. MCLAUGHLIN. He ought to be, of course.

Dr. MELVIN. I think they are; I think they appreciate the danger of breeding from a diseased stallion.

Mr. HAWLEY. Has the area in which the disease appeared increased since last year?

Dr. MELVIN. No; it has decreased; the affected section has been materially reduced in area. There was a stallion that was found afterwards to be diseased that we traced to the Navajo Indian Reservation in New Mexico, but I think we have that well in hand now, so that there will be no considerable spread from that stallion.

Mr. MCLAUGHLIN. Are you able to tell us how many animals were destroyed?

Dr. MELVIN. I have not the figures here, but practically all of these reactors were destroyed.

Mr. OVERMYER. Was there any compensation made?

Dr. MELVIN. Yes, sir; in the case of Montana, where the bulk of these horses are, they use the taxation valuation in making the appraisements.

Mr. OVERMYER. And the State makes the compensation?

Dr. MELVIN. They pay one half and the Federal Government pays the other half.

Mr. HAWLEY. Do you think you would be authorized to pay $75,000 from this item for "quarantine and inspection work," for the services of taking the blood samples, sending them here, and the compensation to the owners for the animals destroyed?

Dr. MELVIN. I think there would be no trouble about that.

Mr. HAWLEY. Well, if that term "inspection work" includes all of that it is a very useful term.

Mr. MCLAUGHLIN. I doubt if that term "inspection work" would authorize the use of that money in that way.

The CHAIRMAN. Your general authority for doing this kind of work, Dr. Melvin, is contained in that language above?

Dr. MELVIN. In item 52.

The CHAIRMAN (continuing). Near the end of that item—the last four lines—occurs this language:

> To purchase and destroy diseased or exposed animals or quarantine the same, whenever, in his judgment, necessary to prevent the spread of pleuropneumonia, tuberculosis, or other diseases of animals from one State to another.

That is the authority under which you pay the expenses of foot-and-mouth disease and a part of the valuation of these destroyed horses, and so on?

[illegible] these specific matters appear in these
[illegible] "shall prevail"
[illegible] something in that suggestion; but I
[illegible]
Mr. [illegible] the principle, but the application of it is
[illegible] reproduction.
[illegible] taken that language.
Mr. [illegible] necessary to put it in the State
[illegible] be limited. Our authority would only be
[illegible] prevailing disease from being spread from
[illegible] Border. [illegible] on the part of the
[illegible] that this will [illegible] reposition. So far as
[illegible] and that you have to minority
[illegible] interstate exposition at all?
Dr. [illegible] that question has ever been raised in
[illegible]
[illegible] that we would have to qualify
[illegible] Border because it has arisen in
[illegible] as yet.
Dr. [illegible]
[illegible] with the Inter-
[illegible]
Mr. [illegible]
[illegible] Would the Veterinarian undertake
[illegible] result in your examin-
[illegible]
[illegible] and we share the ex-
[illegible] involved. The authority
[illegible] with the State authorities.
[illegible] Would there be [illegible] have not been
[illegible] animals?
[illegible] has been stated
[illegible]
Mr. [illegible] like to know what the average is per
[illegible] have been destroyed, and for mares.
[illegible] impression that the average value of mares
[illegible] and of stallions from $50 to
[illegible] that statement can not be taken as accurate.
[illegible] make that statement more definite
[illegible]
[illegible] get the information from the field:
[illegible]
[illegible] Mr. Hawley?
[illegible] the average and the total
[illegible] destroyed and those not stallions
[illegible]
Mr. [illegible] We have limited stallions
[illegible] been appraised at more
[illegible] the State has taken care
[illegible]
Mr. Hawley. [illegible] more than $100?
[illegible] that is, as our one-half of the

Mr. HAWLEY. But not to exceed $100 for any one animal?

Dr. MELVIN. No, sir.

The CHAIRMAN. Has your work progressed far enough for you to give the committee any idea as to the ultimate eradication of dourine from this country; if so, how long will it take you?

Dr. MELVIN. From present indications it will probably take two years more. There will be a full year's work under this estimate—almost full, not quite—and probably a very much reduced amount of work the next year; that is, the year 1918.

The CHAIRMAN. Where did this disease come from originally? Is it an imported disease?

Dr. MELVIN. It is an imported disease. We think it reached this country through French horses. It exists in certain sections of France, in the vicinity of Spain—in the Pyrenees Mountains.

Mr. HOWELL. Does it require a blood test to determine whether the disease is dourine or not?

Dr. MELVIN. Except in advanced cases; in the incipient form it is unrecognizable, and for this reason a good deal of the work we did years ago was incomplete, because we could not recognize the disease in these earlier stages. Between two and three years ago, in our laboratory, Dr. Mohler devised a method of determining the disease by blood examination, and since then we have been able to pick out these cases in the earliest stages.

As an instance, we brought several horses from Dakota here for experimental purposes. One of these was a fine Percheron mare. She stood up and did farm work for almost two years without showing any deterioration until suddenly the collapse came, and she went off in flesh until she was practically skin and bones, was unable to stand, and died in a very short time. Now, that was an acute form; in other cases the disease becomes more chronic and the animals live a great deal longer.

The CHAIRMAN. You are studying the nature of this disease at the experiment station at Bethesda in the hope of getting some remedy for it, are you not?

Dr. MELVIN. Yes, sir; we are trying to discover some remedy or some cure for the disease, but in the meantime we are taking this method of trying to eradicate it from the country.

Mr. HAWLEY. Do you find, in the four States where the disease is prevalent, any owners of herds who will not bring their animals in and have them tested, where you suspect that there are on the ranges animals that are infected with the disease?

Dr. MELVIN. I think in these cases that the State takes control, collects the animals, and proceeds to test them.

Mr. HAWLEY. You think in none of the States is there a center of infection that is not under control, do you?

Dr. MELVIN. No; I do not think there is now.

Mr. MCLAUGHLIN. Do you mean by that that there is a State law which forbids the use of animals that have not been inspected?

Dr. MELVIN. No.

Mr. OVERMYER. We have such a law in Ohio, I think.

Dr. MELVIN. I could not say as to that.

Mr. OVERMYER. I am quite sure there is.

Dr. MELVIN. But the most of these animals, Mr. McLaughlin, are not work animals. They are bred solely to sell their progeny; they are animals that run at large on the range, and from time to time their progeny is gathered together and sold. At Miles City, Mont., there is a large horse market, and it is usual to have sales at intervals of a month or two. Eastern buyers come there in large numbers, and the animals are brought from all the surrounding country, and, while some of those animals are work animals, a majority of them are breeding animals.

Mr. MCLAUGHLIN. If the animals are brought there for that purpose—to be sold, to be taken away—there would not be much, if any, breeding of the animals that were there at that time, would there?

Dr. MELVIN. No; the animals that are brought to the sale are all marked. No animals are allowed to go out of that section unless they have brands showing that they have been inspected and are free of disease.

Mr. MCLAUGHLIN. Do you not find dourine, in some cases, scattered around among the animals on the farm that are not brought to the round-up?

Dr. MELVIN. They have to be looked after in the same way that we try to eradicate disease in any of the Eastern States. We would have to go from farm to farm and collect blood samples from any of those suspected animals on the farms.

Mr. MCLAUGHLIN. Has there been any work along that line, or have you confined your work to the animals collected at the round-up?

Dr. MELVIN. The work is carried on in this whole section, whether on the range or on farms. Of course, farms are confined in that section to certain localities.

Mr. MCLAUGHLIN. You mentioned the round-up several times and I did not know whether your work was confined solely to the animals collected at the round-up.

Dr. MELVIN. No; it is not confined solely to that. That is the bulk of the work, however. The most of these horses are range horses.

Mr. HELGESEN. Is there any dourine in North Dakota now?

Dr. MELVIN. Yes. If the chairman wishes, I will read the figures.

The CHAIRMAN. Yes; if you please.

Dr. MELVIN. In North Dakota, from July 1 to December 30, 1914, there were tested 6,000 animals: 308 reacted, making a percentage of 5. From January 1 to June 30, 1915, there were 13,000 tested, of which 263 reacted, making a percentage of 2.

Mr. HELGESEN. Do you think that is pretty well taken care of now in that State?

Dr. MELVIN. It is being taken of; yes, sir.

Mr. HELGESEN. Another question: Are you asking for any appropriation this year for dourine?

Dr. MELVIN. Not specifically. We expect to use $75,000 of the lump fund of $607,000.

Mr. HELGESEN. $75,000?

Dr. MELVIN. Yes, sir.

Mr. MCLAUGHLIN. The question has been asked whether the language in this item 53 would authorize the use of that $75,000, and especially whether it would direct its use.

Mr. HELGESEN. What would be the objection to making a separate

Dr. MELVIN. We thought if we got that total amount it would be unnecessary to do that; that we could handle it under the general language of the law, the same as we would in the case of any other contagious disease.

Mr. HELGESEN. What is this mallein that you have here in this item?

Dr. MELVIN. That is a preparation for the testing of horses to determine the presence of glanders.

Mr. HELGESEN. If you think this language covers it, it is all right; but that is such a serious proposition that we ought to be sure that there would be no doubt about your being able to use the money in this way under this language.

The CHAIRMAN. Yes; that language could easily be broadened to include dourine. There would be no trouble about that. I think it is very well to call it to the attention of the committee, however.

Mr. HELGESEN. All right.

The CHAIRMAN. Now, will you take up the next item, the inspection of southern cattle, and give us a short statement about that? Tell us just what you mean by that, what you are doing, and what you are spending for it.

Dr. MELVIN. As the members of the committee know, there is a quarantine in many of the Southern States on account of the existence of the cattle tick, which is a carrier of a disease known as Texas fever. It is necessary for a large proportion of those animals to be marketed in the North: and for them to reach northern markets we have to maintain a supervision over their transportation. That item is largely for looking after the safe transportation of these southern cattle from the quarantined areas to the market centers for slaughter.

The CHAIRMAN. In other words, that item is an additional expense connected with your tick-eradication work?

Dr. MELVIN. Yes; that was in existence before tick eradication was begun.

The CHAIRMAN. Yes; I know that. How much are you spending for that?

Dr. MELVIN. In all of the interstate transportation of live stock there is an expenditure of $107,962, and of that probably 65 to 70 per cent is on account of the transportation of these southern cattle.

Mr. RUBEY. That would be about $65,000 to $75,000?

Dr. MELVIN. About that; yes, sir.

Mr. MCLAUGHLIN. Do you mean that from 65 to 70 per cent of that amount is on account of the transportation of southern cattle; that is, inspecting the cattle that have been infected with tick and releasing those where the tick has been eradicated, and so on?

Dr. MELVIN. The major part is for the supervision of the transportation of cattle infected with tick and going to northern markets for slaughter. There is a special provision allowing such cattle to pass interstate to slaughter centers.

The CHAIRMAN. Your inspection work in that regard is for the purpose of preventing the spread of the cattle tick from the box cars and the like of that, is it not?

Dr. MELVIN. Yes, sir; and seeing that they are yarded in special sections of the stockyards and that other cattle are not allowed to mingle with them or to occupy premises that they have occupied.

Mr. McLAUGHLIN. Is the work of that kind that you do connected in any way with the work that you do under item 54, so that you could use the money appropriated under one item for the work that is appropriated for under the other item?

Dr. MELVIN. No; they are kept separate.

Mr. McLAUGHLIN. Is the work entirely separate?

Dr. MELVIN. It is of an altogether different nature. Occasionally a man engaged in one of these lines of work may be used in the other work; but that would be to such a small extent as not to materially affect these appropriations.

The CHAIRMAN. Item 53 has to do purely with inspection work of cattle in transportation, has it not?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. And item 54 has to do with the problem of the eradication of the tick upon the premises—upon the farms?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Does that make the difference clear?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. If that is all on that proposition, take up the next, the supervision of the transportation of live stock and the inspection of vessels. Tell us how much you are expending for that, and what you are doing under that subdivision.

Mr. HAWLEY. That is in item 53?

The CHAIRMAN. That is in item 53. You see, item 53 is broken up into a number of subdivisions, and I want to get each part into the record, if I can, in the order in which it occurs.

Mr. HOWELL. How would it do to have this statement from which Dr. Melvin reads incorporated into the record?

The CHAIRMAN. In revising his statement to the committee, he can amplify somewhat and condense also, if he will.

Dr. MELVIN. The supervision of the transportation of live stock, as I have stated, covers the supervision of the transportation of southern cattle and, in addition to that, includes the inspection and supervision of animals at the large stock yards, so as to prevent the interstate movement of animals affected with contagious diseases.

The supervision of animals for export and vessel inspection is very much less now than it was some years ago, on account of there being practically no export of live stock at present, although during the past year there was an exportation of 10,000 cattle to France. This includes principally the exportation of horse stock, of which there has always been some and since the war a great deal.

The CHAIRMAN. How much do you expend under that item?

Mr. CANDLER. The note under the item states the amount as $122,000, does it not? It says it is proposed to reduce the amount from $132,000 to $122,000 for the supervision of the interstate transportation of live stock.

Dr. MELVIN. This item as it appears in the estimates is the usual amount expended for this work. We expended last year $107,000, the reduction being due to the fact that funds were taken for the foot-and-mouth disease work. In fact, several of our general-expense items were reduced more or less on that account.

The CHAIRMAN. I assume from your former statement that you expect to expend of this appropriation, if allowed, $122,000, both for

inspection of southern cattle, the supervision of the transportation of live stock, and the inspection of vessels; and you had just previously said that 70 per cent of that sum would be used for the inspection of southern cattle. Is that true?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. So that it will be something in the neighborhood of $35,000 or $40,000 that you are using here for the supervision of the transportation of live stock and inspection of vessels; is that correct?

Dr. MELVIN. That is about right; yes, sir.

The CHAIRMAN. That is what I am trying to get at, so that if the question arises on the floor of the House we can answer it.

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Take up your next item, please, the execution of the 28-hour law.

Dr. MELVIN. Under that line of work we expended $7,103.

Mr. MCDERMOTT. How many violations were there last year, and how much in fines has the Government collected from violations of this act?

Dr. MELVIN. That has been published in the report of the solicitor of the department, I think. I have the figures on hand for 1914, however, and if you will permit me to read them, I will do so.

The CHAIRMAN. Yes.

Dr. MELVIN. During the fiscal year 1914 there were submitted to the solicitor of the department 1,608 cases of alleged violation of the 28-hour law; the fines imposed in the cases decided in favor of the Government, including costs, amounted to $47,594.76. During the past year even a larger sum was collected as penalties for violations of this law.

Mr. MCLAUGHLIN. Do you mean they are violating that law just as much now as ever?

Dr. MELVIN. Yes, sir; we find violations. We have to keep constantly watching them and reporting these violations; they occur for various reasons.

Mr. MCLAUGHLIN. You are making money out of that, then?

Dr. MELVIN. Yes, sir; that is a paying proposition.

Mr. MCDERMOTT. But your department does not get the money?

Dr. MELVIN. No, sir; that goes into the Treasury.

Mr. MCDERMOTT. The cost was about $7,000, and the Government took in about $47,000.

The CHAIRMAN. Suppose we put in the record at this place the figures for 1915, as the solicitor gives them:

Of the cases reported during the fiscal year 1915, 69; and of those pending at the close of the fiscal year 1914, 1,175; in all, 1,244 were terminated during 1915.

Penalties aggregating $80,300 were recovered in 597 cases. Six hundred and forty cases were dismissed and 7 were terminated adversely to the Government.

Then follows a detailed list.

If there are no questions on that subdivision, will you take up your next work, the inspection and quarantine of imported animals, including the establishment and maintenance of quarantine stations and the alteration of buildings thereon. Tell us something about that and what you propose to expend the money for.

Dr. MELVIN. We have three quarantine stations for animals from overseas; one near Boston, one near New York, and one near Baltimore. Practically the only animals permitted entry from abroad are from Great Britain, and at the present time they are not permitted on account of the existence of foot-and-mouth disease in England. The bulk of our importations of cattle come from Mexico and from Canada. The cost of inspecting the imported animals from Mexico amounted to $20,409.19; from Canada, $33,707.34; imports of animals from other than North American countries, $2,155.96; from Great Britain, $3,545.24; quarantine of animals at ports of entry, $9,286.66; and the supervision of the importation of hay, hides, etc., $1,212.84.

The CHAIRMAN. You maintain these quarantine stations, of course, to prevent the importation of diseases into the country?

Dr. MELVIN. Yes, sir. Along the borders of Canada and Mexico there are certain ports of entry which are agreed upon by the Treasury Department and the Agricultural Department at which importations are permitted. At the principal ones we have men stationed permanently, and where the animals come in only intermittently we provide for inspection by sending men from some near-by station or by having one man look after several of these substations.

The CHAIRMAN. You have to have highly trained men for that kind of work, do you not?

Dr. MELVIN. Yes; we have to have experts in animal diseases.

The CHAIRMAN. How much are you expending for this service, and how much do you propose to expend under this bill?

Dr. MELVIN. The aggregate will be about $70,000.

Mr. ANDERSON. That is very much in excess of the amount which you expended last year?

Dr. MELVIN. I think that work has been about the same from year to year.

Mr. ANDERSON. What I have in mind is this: I have here your Program of Work for 1916.

The CHAIRMAN. What page?

Mr. ANDERSON. Ninety-two. I noticed, as you were reading the amounts that you spent last year on these various items, that they were very much smaller than the proposed expenditures under your Program of Work. For instance, under "Inspection of animals for importation from other than North American countries." I think you stated you spent some $2,000; your proposed expenditure for 1916 is $8,000. For "Inspection and testing of animals in Great Britain intended for export to the United States," the amount for last year was $3,545.24, and your proposed expenditure for 1916 is $7,000. And so it goes all the way through the various items, unless I have misinterpreted your statement somewhere.

Dr. MELVIN. What you are reading from is an estimate, and this, as I understand it, is a statement of what was actually expended last year.

Mr. ANDERSON. I understand that, but what I am getting at is, Why is it necessary to estimate (and I suppose appropriate) a so much larger sum than your experience shows you are actually expending?

Dr. MELVIN. As I stated a moment ago, many of these lines of work which we have previously carried on and expect to carry on

were seriously interrupted on account of the existence of foot-and-mouth disease; and there will be a considerable difference in statements as to what we actually spent last year as compared with what we had spent in previous years and what we are estimating for next year.

Mr. ANDERSON. Let us understand that. Do you mean that a part of these appropriations have been used for the foot-and-mouth disease work; that you have been obliged to use the men who were formerly employed on this work in foot-and-mouth disease work, so that you did not expend the funds appropriated for these purposes?

Dr. MELVIN. We used some of those men, and, of course, their salaries were paid from the appropriations which permitted it. In the case of certain appropriations we were not able to transfer men or funds to this other work; but under this general authority in item 52 we were at liberty to use in the foot-and-mouth disease work the funds carried in many of these items. Some of our ordinary work was demoralized anyhow on account of foot-and-mouth disease, and the expenditures would naturally have been less. In other lines of work we were obliged to take the men from that other work and put them on the foot-and-mouth disease work; and then, of course, the sums expended from those amounts would be less and would be chargeable to foot-and-mouth disease eradication.

Mr. ANDERSON. Can you state to what extent the appropriations for other items than foot-and-mouth disease have been used in foot-and-mouth disease work?

Dr. MELVIN. Under general expenses (inspection and quarantine), 1915, the sum of $194,795 was used in foot-and-mouth disease work, leaving the net amount expended for the specific projects under this appropriation $430,725. That would, I think, very materially change the figures or explain the difference between the figures I have read and those showing proposed expenditures for the current fiscal year.

Mr. MCLAUGHLIN. Did you give there the total amount expended for the foot-and-mouth disease work?

Dr. MELVIN. No sir; just the amount that was used from this fund (inspection and quarantine) on foot-and-mouth disease work.

Mr. MCLAUGHLIN. All right.

The CHAIRMAN. You used a part of each of these various sub-appropriations, did you not, in your foot-and-mouth disease work?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. That is to say, you called upon any of these funds that you thought were available to help you meet the emergency due to the outbreak of foot-and-mouth disease, before the emergency appropriation given to you became available?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. And, therefore, the expenditures during the last fiscal year under many of these items were very much reduced?

Dr. MELVIN. They were very much reduced.

Mr. OVERMYER. Is there any quarantine now anywhere in the country for foot-and-mouth disease?

Dr. MELVIN. There is a quarantine in parts of three counties in Illinois only.

Mr. HAWLEY. Did your transference of money from those other funds so that foot-and-mouth disease work cripple the work from which those funds were transferred?

Dr. MELVIN. It did temporarily; but we concluded that the foot-and-mouth disease eradication was much more important; that it means either prompt eradication or permanently fixing upon this country a disease which would exact millions of dollars each year; and we made every sacrifice within reason to try to get rid of that disease.

Mr. HAWLEY. It temporarily embarrassed your other projects?

Dr. MELVIN. Yes, sir; it did.

Mr. ANDERSON. These funds were only used, then, prior to the time when an appropriation for foot-and-mouth disease work specifically became available?

Dr. MELVIN. Yes, sir; not afterwards.

Mr. HAWLEY. I would like to know what proportion of the animals offered for import from abroad were diseased, and what the prevalent diseases were which the animals had?

Dr. MELVIN. I have not such a statement here.

Mr. HAWLEY. Can you put it in the record of the hearings?

Dr. MELVIN. Yes, sir.

(The statement referred to follows:)

Statement showing the number of imported animals examined at ports of entry and the number rejected for the period from July 1, 1914, to June 30, 1915, inclusive.

	Cattle.	Sheep.	Swine.	Horses.	Goats.	Other animals.	Rejected.
Canadian animals inspected	189,153	9,618	174,128	9,136	11	259	72
Mexican animals inspected	155,242	144,827	1,973	14,218	53,978	12	[1] 6,048
Animals from countries other than Canada and Mexico	811	854	34	821	.....	413	[2] 40
Total	345,206	155,499	175,237	23,205	53,989	684	6,160

[1] 6,041 cattle and 2 horses rejected on account of the Texas fever tick.
[2] Animals rejected on account of tuberculosis.

The CHAIRMAN. If there are no further questions, will you take up the next subdivision of that item 53, the inspection work relative to the existence of contagious diseases, and the tuberculin and mallein testing of animals. Please tell us what you are doing and how much you are spending upon that work?

Dr. MELVIN. For inspection work in connection with the tuberculin testing of cattle and the mallein testing of horses for interstate transportation there was expended $19,730.30.

Mr. MCLAUGHLIN. How do you carry on that work?

Dr. MELVIN. The bulk of that work is done from these principal stockyards, when animals are in course of transportation. At a number of these centers—not all of them—we have men engaged in testing animals, either cattle with tuberculin or horses with mallein, which are in transit to States that require a certificate from the bu[illegible]ore the animals are permitted entry into those States. A

great many States now have that requirement, particularly as to dairy and breeding cattle.

Mr. McLAUGHLIN. That means, does it, that if one State forbids the importation of animals without a test the Federal Government goes to the expense of making that test and satisfying the State that otherwise would not permit the entry of the cattle?

Dr. MELVIN. To a considerable extent. A great many requests come to us to make tests throughout the country in the various States; those we have generally declined to make. But we have arranged, at a number of these stockyard centers, to make these tests of the animals when they are brought there in course of transportation.

Mr. RUBEY. Is there any charge for making those tests?

Dr. MELVIN. Not at the stockyard centers. Occasionally, where a man wants to ship a carload or two carloads of cattle from a given point within a State we require him to provide for the transportation and subsistence expenses of our inspector.

Mr. McLAUGHLIN. In some cases the authorities of one State accept the certificate of the authorities of another State; that is, the State from which the animals are shipped?

Dr. MELVIN. Yes; in a great many instances; but in others they will not. They require either the tuberculin test by the bureau or that the animals be passed into quarantine upon their arrival in the State, and be subjected to inspection and testing there.

Mr. McLAUGHLIN. Why should not the authorities of a State to which large quantities of animals are shipped be required to provide that inspection themselves?

Dr. MELVIN. Take the case of Wyoming, for instance. The authorities recently passed an order requiring that animals be accompanied by a tuberculin test or else be quarantined and submitted to test after their arrival. They get cattle from a great many States, and I guess it would require a large force of inspectors in that part of the State if they had men in some 10 or 20 different States. I am using that State merely as an illustration.

Mr. ANDERSON. Would it be possible to [illegible] the system so as to make this proposition self-sustaining?

Dr. MELVIN. It would be possible, but I do not believe it would be desirable. So far as possible, I would prefer, and I think the committee would prefer, that our men should not receive fees for their work. It opens an avenue there that I do not think would be desirable.

Mr. ANDERSON. I did not mean, of course, a fee paid directly to the inspector. The idea I had in mind was that the inspector be employed, as he now is, by the department, and that the department require a fee direct to it wherever inspection is had and a certificate is issued.

Dr. MELVIN. That is possible; yes, sir.

Mr. ANDERSON. I do not see any reason why a service of that kind should not be self-sustaining. It is a service which is done, largely, for the owner of the horses or the purchaser of the horses, and it seems to me that the expense is very properly chargeable to the transaction.

Mr. RUBEY. How much does this service cost?

Dr. MELVIN. $19,737. That was what we spent during 1915; but that is abnormally low, as I have explained, on account of many of the funds being used in the foot-and-mouth disease eradication.

Mr. MCLAUGHLIN. Will you tell us something about how that work of inspection is done, and particularly what becomes of the animals that are found to be infected?

Dr. MELVIN. The operation consists in taking temperatures before the injection of tuberculin or mallein in order to determine whether the animal so far as its temperature is concerned, is in a normal condition.

Mr. MCLAUGHLIN. That is the usual process of determining whether or not tuberculosis is present. But in a large stockyard like Chicago or Kansas City how do you carry on the work? What is done with the animals that react?

Dr. MELVIN. As a general rule, the owner will dispose of the reacting animals by slaughter under inspection at the place where the test is made. If for any reason he will not consent to slaughter, the authorities in the State are notified and they take charge of the animals. As a rule, they either have them passed into quarantine or require their slaughter.

Mr. MCLAUGHLIN. Then you permit the slaughtering of animals for food that you find infected with tuberculosis?

Dr. MELVIN. Yes, sir; under inspection.

Mr. MCLAUGHLIN. That is safe, is it?

Dr. MELVIN. Absolutely.

Mr. MCLAUGHLIN. Well, there are cases where the disease has so far progressed that it would not be safe to use the animals for food, are there not?

Dr. MELVIN. Oh, yes. Of course, as I say, they are slaughtered under inspection. Many of these conditions of tuberculosis are such as not to unfit the flesh for food. Some of them are, but they would be condemned. That is a practice which is carried on in all countries where they have meat-inspection systems.

Mr. MCLAUGHLIN. Where you find the tuberculosis present you forbid the interstate shipment, do you, altogether?

Dr. MELVIN. That is prohibited by the law of 1884.

Mr. MCLAUGHLIN. And when an animal is destroyed, is there compensation to the owner?

Dr. MELVIN. We do not compensate. We have a system of compensation within the District of Columbia, however, inaugurated several years ago.

Mr. WILSON. Who suffers that loss?

Dr. MELVIN. The owner of the cattle, unless he can make an arrangement with the State, which is not generally done.

Mr. MCLAUGHLIN. This law that you speak of, that operates in the District of Columbia, authorizes the destruction of animals infected with disease that may be communicated to human beings, does it not?

Dr. MELVIN. No; it authorizes the destruction of animals infected with contagious or communicable diseases of animals.

Mr. MCLAUGHLIN. "That may be communicated to human be- [illegible] is not that in the law?

Dr. MELVIN. No; I do not think so.

The CHAIRMAN. I think the committee took the other position, Mr. Laughlin. I remember the committee discussed it.

Mr. MCLAUGHLIN. Yes.

Mr. HAWLEY. You spoke about the amount expended last year as ing abnormally low. How was that effected—by reducing the mber of inspections so that the people could not effect a sale, or allowing the animals to go without inspection?

Dr. MELVIN. In many cases we had to neglect the work in order take up this more important work, and there were fewer shipents owing to the quarantine, both Federal and State.

Mr. HAWLEY. Some animals transported from one State to anther without inspection might have been infected with disease?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Are there any further questions, gentlemen? If ot, turn to page 41, item 54, "For all necessary expenses for the radication of southern cattle ticks," etc., $657,400. There is a total ncrease in that item over last year's appropriation of $219,500. Suppose you give the committee, briefly, a history of this cattle-tick work, nd what you have accomplished so far; and, when you have completed that, give us a statement as to the reason for asking for an ncrease of $219,000.

Dr. MELVIN. This work was commenced specifically in 1906, with view to eradicate the tick, so as to permit of the better development f the cattle industry in the South. I have the figures as to the mount of money appropriated from year to year and the amount f territory which was freed of these ticks.

I might explain that this tick is a carrier of a disease known as Texas fever." It interferes in a very serious way with the development of cattle in this tick area and is almost certain death to animals rom outside of this area which might be taken in there for breeding urposes.

Since the work was inaugurated, there has been over 270,000 square iles of territory freed of the ticks. That is somewhat over 30 per ent of the total area which was originally infected. I have here a ap which will indicate the original territory and the area which as been freed of infection, the red portion representing the infected ection, and the white, within the red boundary line and the red, the art which has been freed.

The CHAIRMAN. You evidently have a tremendous area still to lean up, have you not?

Dr. MELVIN. The area on July 1, 1906, amounted to 728,543 square iles. The area released from quarantine to date is 274,282 square iles. The area remaining under quarantine is 453,761 square miles.

Mr. HAWLEY. Was any new area added this year?

Dr. MELVIN. During the past calendar year, there has been released rom quarantine, in the State of Alabama, 6,742 square miles; Arkanas, 2,354 square miles; California, 3,501 square miles; Georgia, 6,222 quare miles; Louisiana, 420; Mississippi, 3,216; North Carolina, 492; Oklahoma, 2,385; South Carolina, 5,535; Texas, 13,516; Virginia, 240; making a total of 49,621 square miles.

Mr. MCDERMOTT. How many cattle are there in that area that is uarantined, or about how many?

Dr. MELVIN. It is estimated that there were about 13,600,000 cattle n the quarantined area on January 1, 1915.

Mr. [illegible] added last year?

Dr. [illegible] That has all been [illegible]

Mr. [illegible] to prevent the spread [illegible] as established by [illegible]

Dr. [illegible] under this supervision of [illegible] which we discussed a moment ago.

Now there has been a decided demand and desire on the part of these various States for the eradication work, both for the purpose of [illegible] and also as the result of a change in the [illegible] the ravages of the cotton-boll weevil. We are estimating that these various States which I have named are expecting to expend during the next fiscal year $975,000, and we are estimating for this appropriation in order to meet the amount that these various States are expecting to spend.

The CHAIRMAN. You may put into the record, by States, if you have that information at hand, the amount that each of these States expects to expend.

Dr. MELVIN. Yes. These funds are provided by the State directly, by the various counties in which the eradication is carried on, and from other sources—large manufacturing concerns, bankers, and others. In Alabama, the State is expecting to appropriate $25,000 and the counties $[illegible]; Arkansas, the State $34,000, other sources $50,000; Florida, the State $15,000; Georgia, the State $29,000, the counties $[illegible]; Louisiana, the State $18,000, counties $90,000; Mississippi, the counties $[illegible]; Missouri has been released from quarantine; North Carolina, the State $8,000, counties $5,500; Oklahoma, the State $[illegible], counties $110,000, other sources $20,000; South Carolina, $[illegible]; Tennessee has been released; Texas, the State $40,000, counties $100,000; Virginia, the State $2,000, counties $7,000; making a total for the States directly of $236,000, the counties $669,730, and other sources $70,000.

The CHAIRMAN. A grand total of how much?

Dr. MELVIN. A grand total of $975,730.

Mr. JACOWAY. After these cattle are dipped, do they ever have any disease of any kind, so far as known to the department?

Dr. MELVIN. They can be reinfected again.

Mr. JACOWAY. I mean, does this arsenic solution affect them in any way in a bad way?

Dr. MELVIN. Not if they are properly dipped. There have been occasions where the dip has been discharged in a careless way, and the cattle drink from contaminated water and are poisoned. In a few instances cattle have been turned out on the pasture while they are still wet and dripping, and the grass, which has become contaminated with the arsenic, is eaten and the cattle poisoned in that way. Occasionally a mistake is made in the preparation of the solution and it is too strong, which causes a great irritation and cracking of the skin. This condition is sometimes so severe as to cause death. But those are incidental occurrences and are not usual.

Mr. JACOWAY. Do you recall now what portions of the State of Arkansas you operated in last year?

Dr. MELVIN. In the northern sections of the State.

Mr. McLAUGHLIN. The northwestern part and the northeastern part, as shown by this map.

Mr. STEELE. Doctor, I am very much interested in this tick, and I want you to keep it at home. Now, do you mean to say you want this $657,000 to form a line indicated by this red line here? As I understand, the Agricultural Department and the Government will not permit these cattle to go into interstate commerce and be transported into other States. Is that the idea?

Dr. MELVIN. They will allow them to go for slaughter, but not for feeding or breeding unless they have been freed of these ticks.

Mr. STEELE. Yes; that is what I understand. In other words, I can not go down there and buy a string of cattle and take them up here into Dakota unless they have been dipped or the tick has been eradicated?

Dr. MELVIN. Yes, sir.

Mr. STEELE. Now, you have been at this business, it seems to me, for a good many years, and these fellows down here in the South are very intelligent fellows, at least I find them so over in the House; have not they discovered that they can eradicate the tick in their States by building these dipping tanks and such things as that? In other words, it seems to me that these States can eradicate their own diseases, as we did in South Dakota, Nebraska, and Wyoming. We went out and caught our cattle on the ranges, you know, one at a time, and dipped them and eradicated that disease. I do not see any red lines up in that country now.

Dr. MELVIN. This disease has never existed in those sections of the country.

Mr. STEELE. Oh, yes; in South Dakota.

Dr. MELVIN. Not this Texas fever tick.

Mr. STEELE. Is this tick you are talking about the Texas tick?

Dr. MELVIN. That is the Texas tick that the circular has reference to; yes, sir.

Mr. STEELE. That is the same tick down here, isn't it?

Dr. MELVIN. Yes, sir.

Mr. STEELE. Well, he has been up in our country.

Dr. MELVIN. Not that we know of.

Mr. STEELE. We brought it up there on the Texas cattle.

Dr. MELVIN. They may be brought up there, but they do not propagate from year to year and become indigenous to those sections of the country as they are in the southern part of the United States.

Mr. ANDERSON. Do they freeze out or what is the cause of it?

Dr. MELVIN. In sections where they have freezing weather they are exterminated. You take the sections shown by the green line on that quarantine map, and that is largely the line of heavy frosts and freezing weather. North of that they do not exist; south of there they are indigenous to the country.

The CHAIRMAN. That tick would not exist here in Washington or propagate itself here in Washington, would it?

Dr. MELVIN. Not year after year; no, sir.

The CHAIRMAN. About where is the line of demarcation?

Dr. MELVIN. It is irregular. It follows approximately what is known as the old Mason and Dixon line.

Mr. JACOWAY. On this map here you have two colors—one yellow and one red. What do the colors denote?

Mr. [illegible]. The white indicates the amount that has been dipped and the yellow shows where we are now carrying on eradication work and the red is where we are not at present working.

Mr. [illegible]. What is your name of employment in the State, Doctor? Are you a [illegible] or a veterinarian?

Mr. [illegible]. I am a veterinarian. I am through the county commissioners because the majority of the counties have the county commissioners [illegible] different States, because [illegible] where there is sufficient [illegible] to make it worth while to the [illegible]. The State will also provide [illegible] appoint the inspectors to work [illegible]. The State [illegible] the cattle and their dipping; after the cattle are dipped they see to the preparation of the dips. These State men largely do that line of work, as I say, it is done almost entirely now by county units.

Mr. [illegible]. Why does not the State require these people in the outlying [illegible] the tick is discovered to dip their own cattle? It is a very simple proposition to get rid of it and eradicate it.

Dr. Mohler. The only answer I can make to that is that it is in line with the present policy of departmental cooperation with the various States in practically all avenues of agriculture. This, of course, is entitled to consideration in that respect, the same as the preceding [illegible] the growing of fruit, or anything of that sort.

Mr. McLaughlin. You might add, too, that it is in line with the disposition of the people. If they can get the Federal Government to put in the money in any part of the country, it seems to be their disposition to want them to do it.

Mr. Howard. That is a very contagious disease.

The Chairman. That unloading proposition—it is a very contagious disease. [Laughter.]

Mr. Watson. Is this tick that you find on the cattle the same tick that so annoys a human being when he goes into the woods down South?

Dr. Mohler. No, that is a different species of tick.

The Chairman. Your policy is not to go into a State or cooperate with a State except upon the basis of approximately matching dollar for dollar?

Dr. Mohler. Approximately, yes, sir.

Mr. McLaughlin. Do you find, after you have done your teaching, that the people are taking those matters up themselves, or are they largely waiting until an agent of the department comes along to [illegible] work?

Dr. Mohler. I suppose [illegible] get ahead of us with this work, [illegible] we [illegible] because I do not think it is [illegible] conducted on a comprehensive plan. Some [illegible] rules and orders will [illegible] consequence the [illegible] and the whole question of tick eradication [illegible]. But where the work is carried on under [illegible] the results are almost [illegible] the great interest that has been aroused in [illegible] has created a tremendous interest in the stock [illegible].

Just last summer there was a shipper from Oklahoma who shipped a number of carloads of cattle to Kansas, to the State market, and instinctively when he got there he started over to the quarantine section of the yards, expecting his stock to be there. They had always been there, and they had always sold for less than cattle from the free sections.

The CHAIRMAN. About how much less—a quarter of a cent; something like that?

Dr. MELVIN. Roughly, from $3 to $6 a head.

Mr. STEELE. A dollar a hundred, many times I have known them to be.

Dr. MELVIN. Well, that is more than I have estimated; but there is always that restriction on these cattle.

The CHAIRMAN. What became of the Oklahoma man, Doctor? I am very much interested in him.

Mr. HAWLEY. Yes; do not lose him.

Dr. MELVIN. Oh, he was very much delighted, of course.

Mr. HAWLEY. Delighted at what?

Dr. MELVIN. At being able to sell his cattle in the free market, without any restrictions, either as food cattle, as breeders to go out into the country again, as feed cattle, or for whatever purpose he pleased. But whenever cattle are shipped from the tick area of the South to those northern markets there is only one disposition that can be made of them—that is for slaughter. They must be killed.

The CHAIRMAN. And must be killed at a price fixed by the fellow who is going to do the killing.

Mr. STEELE. Here is my idea: If you had this appropriation multiplied by two by the States, do you not believe, as a business man, that you could go down there and eradicate the tick from that whole country with the methods you now have and with which you know that you can eradicate this disease?

Dr. MELVIN. You mean in one year?

Mr. STEELE. Yes.

Dr. MELVIN. Oh, no.

Mr. STEELE. That is, if you were the czar of that whole country and could dictate that every man should bring in his cattle and dip them?

Dr. MELVIN. But I am not the czar down there.

Mr. STEELE. It seems to me that it is work and rework and overwork to go into one little community and dip a bunch of cattle and build them the dipping tanks, and then to let those cattle intermingle again, you know.

Dr. MELVIN. They do not do that, Mr. Steele. This is taken up in a systematic way by the counties. Now, in the case of Texas they have put it on a local option basis. The county votes as to whether they shall take up this work or not, and then it becomes a law of the county, and they have to go in and dip the cattle.

Mr. LEE. You may add there, too, in reply to Mr. Steele, that they have to be dipped many times in a year, because in a great many instances just one dipping does not eradicate the tick.

Dr. MELVIN. Oh, no; because a great many of those cattle have to return to their original pasture, and, of course, they pick up a few more ticks and have to be dipped again and again, until finally the

cattle are rid of ticks. If you do not dip the cattle sufficiently to kill the ticks, they drop off and reproduce.

Mr. STEELE. Yes; I understand that from 9 to 11 days after the first dipping they require them to repeat the dipping. I have gone over that and have cleaned up my own herd and my neighbors' herds. In fact, the people of South Dakota went after the State organization and fought it to a finish, and we cleaned up our State. And it seems to me that these people here in the South ought to be required to do that.

Dr. MELVIN. I think you have in mind cattle scabies, which was prevalent in the Dakotas and other parts of the Northwest several years ago. In that case this committee provided funds for a great part of that work and the department had a number of men in the Dakotas.

Mr. STEELE. But the State went after it, you know.

Dr. MELVIN. And we worked in cooperation with the State people, practically along the same basis of cooperation.

Mr. STEELE. But they went after it and cleaned it all up there in a couple of years.

Mr. YOUNG. The great difficulty in Texas (and that is the largest cattle State in the Union I believe there are over 8,000,000 cattle there) is that the farms are largely owned in small allotments of 100 and 200 acres. That is especially true of my county and the large timbered areas. Every farmer has milch cows, and the surplus cattle are sold. The cattle buyers go through that country and pick up the little herds, and then they are shipped to the West, to the cattle section, or to the southern part of Texas. Now, in the western section of the State the large ranchmen all have dipping vats, and in my county we have dipping vats. My brother-in-law is a stockman. They buy these eastern cattle and they dip these cattle as a protection to their own herds. They destroy the ticks in order that the cattle may thrive, but when cattle go onto the market they go back into this infected area, and that naturally requires dipping over and over and over again. And what is true of that county is practically true of other counties in the State.

As Dr. Melvin has stated, we now have the local-option proposition; but, strange to say, through the timbered section of the country the people have not been educated up to it. In some sections they have defeated it at the elections; in one county in my district they recently defeated it; other counties have carried it. So it is a matter of education. They are waking up to the fact of the great loss in handling cattle, and it is a much bigger work than you really think it is, unless you are on the ground and see what you have to contend with. The large ranchmen know, but the ordinary farmer who has just one or two surplus head of cattle a year is not apt to pay much attention to it, and that is the breeding ground.

Mr. HOWELL. Why could not that be taken up as a State matter and a law passed requiring the dipping of cattle?

Mr. YOUNG. The State is making appropriations.

Mr. HOWELL. I mean a law that the people can not ship unless they dip their cattle.

Mr. YOUNG. I think myself it will finally come to that. It is one of t ems, like all the other problems we have to deal with

Mr. HOWELL. In the Western States, where sheep are raised, the States all have very rigid laws compelling them to dip the sheep annually, whether they are infected or not.

Mr. MCLAUGHLIN. How does the area cleared last year compare with the area cleared in former years? What progress are you making, I mean?

The CHAIRMAN. Mr. Harrison informs me that they have a statement in their office which will cover the amount of appropriations for every year since the work began; the amount of money appropriated by the States and counties and other sources from year to year for such work; and the amount of territory covered and freed from year to year and at the present time. I would suggest that we have that put in the record, if the committee is agreeable to it. It will give us a very good idea of the progress of the work in answer to the question.

(The statement referred to follows.)

TICK ERADICATION WORK.

General statement relative to the progress of tick eradication from the beginning of the work in 1906 to January 1, 1915.

Under provisions of the act of Congress approved June 30, 1906, $82,500 was appropriated to enable the Secretary of Agriculture to undertake experimental work in cooperation with the various State authorities in eradicating the ticks transmitting southern cattle fever. The matter was immediately taken up with the States affected and active work was started late in July of that year.

The territory in which it was desired to operate included the States of California, Texas, Oklahoma, Missouri, Arkansas, Louisiana, Kentucky, Tennessee, Alabama, Mississippi, Georgia, South Carolina, Virginia, and North Carolina.

The work of 1906 was largely of a constructive nature, much propaganda work being necessary among individual live-stock owners in order to insure some cooperation; nevertheless, 29,315 herds, consisting of 548,844 cattle, were examined in that year. While for the most part State authorities were willing to aid in the work, there was an almost complete dearth of State laws and funds with which to enable them to render assistance to the Federal inspectors. The more active work, therefore, dates from 1907, and the work accomplished since that date has been of an encouraging nature.

The work is divided into districts of one or two States and is under the direct personal supervision of a Federal inspector in each district. The States place and maintain local quarantines.

The building of vats and other contributions toward the work by private individuals, live-stock associations, business men's organizations, etc., are welcomed, not only from an economic standpoint but also because of the added interest in the work on account of the ownership of some property used in this work.

The department is prohibited by act of Congress from expending funds for the construction of cattle-dipping vats and for the purchase of materials for the preparation of dips, except for experimental purposes. The vats and dipping materials required for use in the eradication of ticks have therefore been provided by either States, counties, or individuals. It may be stated in this connection that vats were in operation in the various States during 1914, as follows:

	Number of vats.		Number of vats.
Oklahoma	229	Mississippi	2,352
Virginia	10	Louisiana	146
Texas	69	Georgia	197
South Carolina	91	North Carolina	35
Tennessee	15	Arkansas	200
Missouri	2	Alabama	443

The department has no record of any vats in operation in the States of California, Florida, and Kentucky, but the system of spraying cattle for ticks was employed in those States.

Since the beginning of the work, in 1906, many obstacles have been overcome. The men starting this work were necessarily without experience in tick eradication. Ignorance and prejudice of many cattle owners, lack of proper State laws, a misunderstanding and lack of knowledge of the proper uses of parasiticides—these are some of the problems that had to be met and that are gradually being solved. Failures of juries to convict violators of quarantine laws and failure to control cattle on free range are still standing to some extent in the way of progress. There is still ignorance, prejudice, and friction to contend with, but every square mile of land freed from ticks tends to overthrow these barriers. Already over 4,000,000 cattle have been placed in the free area, which were previously within the quarantine lines. The saving this means to the cattle owners is amazing. A conservative estimate of the increased valuation of dairy cows is placed at from $5 to $15 each annually. The increase in condition and weight of other cattle, together with the possibilities of improved breeding, through the importation into the area of better blood, adds greatly to this sum.

Statement showing, by States, appropriations by the Federal Government and by States and counties for tick-eradication work, together with the area freed of the tick, during each calendar year from 1907 to 1915, inclusive.

ALABAMA.

Calendar year.	Appropriations.			Area released.
	Federal.	State.	Counties.	
				Sq. mi.
1907	$3,775	$1,335	.....	.....
1908	6,717	2,685	.....	.....
1909	20,107	3,316	$3,292	.....
1910	23,400	2,417	14,549	.....
1911	19,493	1,532	14,829	.....
1912	11,698	2,519	12,823	.....
1913	13,587	1,976	9,335	811
1914	19,976	2,441	9,675	1,754
1915 [1]	49,370	22,003	59,385	6,742
Total	166,123	40,234	123,888	9,307

ARKANSAS.

1907	$9,888	$2,325	.....	.....
1908	10,353	3,940	.....	3,071
1909	23,111	11,231	$426	2,252
1910	28,220	12,622	.....	1,897
1911	21,954	9,869	.....	339
1912	27,993	15,254	315	2,518
1913	27,685	10,975	60	1,708
1914	24,898	10,077	83	.....
1915 [1]	20,299	10,601	.....	2,354
Total	194,401	86,894	884	14,959

CALIFORNIA.

1907	$18,992	$6,720	$11,517	6,570
1908	20,785	3,360	8,642	21,136
1909	24,816	2,515	8,119	8,000
1910	21,160	3,210	5,995	34,777
1911	17,307	2,640	.....	2,636
1912	11,594	2,963	830	750
1913	7,101	1,605	580	1,834
1914	5,077	310	300	.....
1915 [1]	4,907	120	930	3,501
Total	131,739	23,443	36,913	79,204

[1] January to November, inclusive.

nent showing, by States, appropriations by the Federal Government and by States and counties for tick-eradication work, etc.—Continued.

KENTUCKY.[1]

Calendar year.	Appropriations.			Area released.
	Federal.	State.	Counties.	
				Sq. mi.
	$3,275	.....	$1,480	.....
	895	.....	430	841
Total	4,170	.....	1,910	841

FLORIDA.

matic work just recently taken up and no area yet released.

GEORGIA.

Calendar year.	Appropriations.			Area released.
	Federal.	State.	Counties.	
				Sq. mi.
	$16,231	$46	.....	.....
	7,290	.....	.....	.....
	4,874	2,489	$450	.....
	8,188	5,029	1,925	815
	14,323	6,562	3,979	.....
	13,217	9,056	6,568	257
	29,539	15,262	13,960	1,969
	52,418	18,585	24,591	974
	48,673	19,505	26,735	6,222
Total	194,753	76,534	78,208	10,237

LOUISIANA.

	$4,259	$3,255	.....	.....
	8,035	3,799	.....	.....
	11,421	4,058	.....	.....
	12,568	4,948	.....	.....
	8,113	3,733	.....	.....
	9,526	3,947	$4,301	.....
	10,474	4,290	2,812	650
	13,932	5,789	9,570	1,197
	35,451	11,171	45,706	420
otal	113,779	44,990	62,389	2,267

MISSISSIPPI.

	$2,656	$1,962	$192	.....
	10,367	2,137	1,382	.....
	18,879	9,994	18,943	1,407
	48,187	21,190	36,329	625
	45,894	10,986	60,894	4,182
	63,340	10,920	79,257	6,647
	73,548	10,836	102,395	9,973
	31,249	13,586	85,332	3,216
otal	294,120	81,611	384,724	24,050

[1] Entirely released from quarantine.

[2] January to November.

Since the beginning of the work, in 1906, many obstacles have been overcome. The men starting this work were necessarily without experience in tick eradication. Ignorance and prejudice of many cattle owners, lack of proper State laws, a misunderstanding and lack of knowledge of the proper uses of parasiticides—these are some of the problems that had to be met and that are gradually being solved. Failures of juries to convict violators of quarantine laws and failure to control cattle on free range are still standing to some extent in the way of progress. There is still ignorance, prejudice, and friction to contend with, but every square mile of land freed from ticks tends to overthrow these barriers. Already over 4,000,000 cattle have been placed in the free area, which were previously within the quarantine lines. The saving this means to the cattle owners is amazing. A conservative estimate of the increased valuation of dairy cows placed at from $5 to $15 each annually. The increase in condition and weight of other cattle, together with the possibilities of improved breeding, through the importation into the area of better blood, adds greatly to this sum.

Statement showing, by States, appropriations by the Federal Government and by States and counties for tick-eradication work, together with the area freed of the tick, during each calendar year from 1907 to 1915, inclusive.

ALABAMA.

Calendar year.	Appropriations.			Ar rele
	Federal.	State.	Counties.	
				Sq
1907	$3,775	$1,335		
1908	6,717	2,085		
1909	20,107	3,316	$3,283	
1910	23,400	2,417	14,549	
1911	19,493	1,532	14,829	
1912	11,696	2,519	12,823	
1913	13,587	1,976	9,335	
1914	19,976	2,441	9,675	
1915 [1]	49,370	22,008	59,385	
Total	168,123	40,224	123,888	

ARKANSAS.

1907	$9,886	$2,325		
1908	10,333	3,940		
1909	23,111	11,231	$426	
1910	28,220	12,622		
1911	21,954	9,809		
1912	27,993	15,254	315	
1913	27,685	10,975	60	
1914	24,898	10,077	83	
1915 [1]	20,299	10,601		
Total	194,401	86,894	884	

CALIFORNIA.

1907	$18,902			
1908	20,7[illegible]			
1909	24,[illegible]			
1910	29,[illegible]			
1911				
1912				
1913				
1914				
1915 [1]				
Total				

[1] January to

Statement showing, by States, appropriations by the Federal Government and by States and counties for tick eradication work, etc.—Continued.

MISSOURI

Calendar year	Appropriations			Area released
	Federal	State	Counties	
				Sq. mi.
1909	[illegible]	[illegible]		
1910	[illegible]	[illegible]		
1911	[illegible]	[illegible]		
1912	[illegible]	[illegible]	$650	125
1913	[illegible]	[illegible]		1,087
1914	[illegible]	[illegible]		234
1915 [2]				
Total	[illegible]	[illegible]	650	1,446

NORTH CAROLINA

1907	$21,346	$2,165		2,363
1908	[illegible]	[illegible]		6,113
1909	[illegible]	[illegible]		1,581
1910	[illegible]	[illegible]		
1911	[illegible]	[illegible]		[illegible]
1912	[illegible]	[illegible]		394
1913	[illegible]	[illegible]		889
1914	[illegible]	[illegible]	$8,105	2,555
1915 [1]	[illegible]	[illegible]	[illegible]	5,482
Total	13,139	15,170	1,398	19,914

OKLAHOMA

1907	$[illegible]	[illegible]	[illegible]	
1908	[illegible]	[illegible]	[illegible]	2,622
1909	[illegible]	[illegible]	[illegible]	2,140
1910	[illegible]	[illegible]	[illegible]	988
1911	[illegible]	[illegible]	[illegible]	4,273
1912	[illegible]	[illegible]	[illegible]	2,298
1913	[illegible]	[illegible]	[illegible]	2,385
1914	[illegible]	[illegible]	[illegible]	2,785
1915 [1]	[illegible]	[illegible]	[illegible]	2,385
Total	[illegible]	[illegible]	[illegible]	19,985

SOUTH CAROLINA

1907	$[illegible]	[illegible]		
1908	[illegible]	[illegible]		
1909	[illegible]	[illegible]		2,673
1910	[illegible]	[illegible]		
1911	[illegible]	[illegible]		
1912	[illegible]	[illegible]		3,797
1913	[illegible]	[illegible]	$1,053	2,145
1914	[illegible]	[illegible]		2,053
1915 [1]	[illegible]	[illegible]		5,533
Total	155,546	149,936	1,053	16,201

[1] Entirely released from quarantine. [2] January to November.

***nent showing, by States, appropriations by the Federal Government and by States and counties for tick-eradication work, etc.*—Continued.**

TENNESSEE.[1]

Calendar year.	Appropriations.			Area released.
	Federal.	State.	Counties.	
				Sq. mi.
	$43,843	$75	$18,009	2,795
	30,266		16,448	3,826
	32,124		18,615	3,228
	26,345		25,831	485
	11,410	284	18,635	1,655
	14,648	2,263	23,723	1,320
	15,295	4,820	18,818	3,694
	6,450		5,312	54
	1,294		3,106	
otal	181,675	7,442	148,497	16,987

TEXAS.

	$15,560	$25		
	9,593			660
	13,393	50	$1,749	321
	15,427			9,854
	14,333	4,299	1,251	1,976
	13,094	6,337		5,240
	15,483	7,993		8,392
	13,687	18,041		1,862
	12,689	53,340		13,516
ɔtal	123,259	90,085	3,000	42,321

VIRGINIA.

	$17,208		$6,250	4,445
	13,043		355	3,181
	11,801	$25	1,150	2,152
	7,756		119	529
	7,180		530	869
	8,341		250	
	8,697		47	
	7,122	400	900	726
	1,430			240
ɔtal	82,578	425	9,601	12,142

[1] Entirely released from quarantine. [2] January to November.

Summary, 1907–1915.[1]

State.	Federal funds.	State and county funds.	Area released.
			Sq. miles.
a	$168,123	$164,112	9,307
as	194,401	87,778	14,959
la	131,739	60,356	79,204
ky	4,170	1,910	841
	194,753	154,742	10,237
na	113,779	107,379	2,267
ppi	294,120	466,335	24,050
l	32,423	23,182	1,386
arolina	163,039	64,050	24,914
ma	304,427	464,618	19,966
arolina	155,546	110,891	16,201
see	181,675	155,939	16,987
	123,259	93,085	42,321
a	82,578	10,026	12,142
otal	2,144,032	1,964,403	274,782

[1] To and including November, 1915.

Mr. McLAUGHLIN. Some of us thought the appropriations for this kind of work would grow less as years went by, because it is a very simple matter, indeed, to kill the cattle; and as the people became educated to know the cause of it and the process of it is so easy, that they would do it themselves. Now some of the members of the committee know that I have been insistent upon this proposition, that the appropriations of the Federal Government should be very liberal, indeed, for the purpose of making investigations, but that when a process is established, which is very easy of application and simply becomes a matter of the personal labor and the expenditure of a little money to carry it out, after the people at some stage in the proceedings ought to be left to do the work themselves. As this committee knows, I have never voted against an appropriation for an investigation or for educating the people; but when the remedy is discovered and the process is known and it is very easy of application and it simply becomes a question of dollars and cents and doing the physical work, there is a time when the people ought to be left to do it themselves. I appreciate the magnitude of this problem and what it means not only to the South, but also to the rest of the country, but it would look to me as if this proceeding is one that finally ought to be carried on by the people themselves; and still each year this appropriation increases.

The CHAIRMAN. Of course, that will be a matter for the committee to fight out among themselves when they go into meeting.

Mr. CANDLER. How much is it estimated that those ticks affect the value of cattle in the course of a year—how many millions of dollars?

The CHAIRMAN. $50,000,000, this poster says.

Dr. MELVIN. From forty to fifty millions.

Mr. CANDLER. From forty to fifty millions a year. And it is becoming a national question by reason of the shortage of our meat supply?

Dr. MELVIN. It is not only becoming; it is a very important question now.

Mr. CANDLER. That is a very important question to our country, and has been for a long time.

Dr. MELVIN. We are expecting that when the tick is eradicated this southern territory will become a very important meat-producing center. The summers are long and they can feed at the minimum cost, and many of the sections are admirably adapted to live-stock raising.

Mr. STEELE. Here was the thought that I had: That maybe we had advanced to the point in the control of this tick down there where the Government could form its line and say to that country, "Now, if you do not eradicate this pest we will not permit your stock to go elsewhere," and that that would force those people, who ought to be vitally interested in their own affairs, to eradicate the tick themselves, because they know how to do it.

The CHAIRMAN. Mr. Steele, that is just exactly what the Government is doing now under the law. The Government says to the man that he can not ship his tick infested cattle out of the southern territory into other territory except for immediate slaughter, and the Government has set up its lines and permits the crossing of those lines only under very rigid requirements and regulations. And that is true not only of tick infested cattle but also in the case of dourine

of horses and a number of other of these contagious and infectious diseases. It is a policy that has been laid down here by Congress for many years. It goes back to the time of the founding of the Bureau of Animal Industry; is that not true, Dr. Melvin?

Dr. MELVIN. In 1884; yes, sir.

The CHAIRMAN. In 1884, as I recall the date of the act. That is a matter of policy we will discuss in the committee. We have Dr. Melvin here for the purpose of getting the viewpoint of the department on these various propositions.

Mr. HAUGEN. I would like the doctor, if he can, to make an estimate of the amount of money and time that will be required to eradicate the tick.

The CHAIRMAN. I am glad you asked that; I was going to bring that out myself.

Mr. HAUGEN. I think that question was asked last year and I would like to have an answer.

The CHAIRMAN. I had noted on the margin here to ask, "With such an appropriation as you ask here, how long before there will be a general clean-up of the tick in this country"? If you will give us an estimate on that proposition the committee will regard it as very valuable.

Mr. RUBEY. That would depend largely on the cooperation of the various States and counties. I think you will find that the States are responding very liberally in recent years; more so than they have in the past, and if we continue to increase our appropriation with the money that comes from the counties and States and other sources, it can be eliminated much quicker.

The CHAIRMAN. Upon the assumption that the States in the future will furnish $900,000 and some odd, as they propose to do for the next fiscal year, and we should allow this appropriation for $657,000, how long will it take you to clean up? That is a matter, I think, the committee ought to know.

Dr. MELVIN. Under those conditions I should say it would take at least six years more.

Mr. ANDERSON. I notice in the Program of Work that it is stated here that the probable date of completion will be 1924. That would be nine years, at an approximate appropriation of $400,000.

Dr. MELVIN. That is based upon the progress made heretofore, you know; and, of course, that would all be contingent upon the same circumstances of cooperation, funds, etc.

The CHAIRMAN. I assume, of course, that naturally the increase of $219,000 asked for in these estimates is due to the fact that the department officials have agreed themselves that we ought to attack this problem more vigorously in the future than we have attacked it in the past. Is that the idea?

Dr. MELVIN. Yes, sir. I think when people are in a frame of mind to take up this line of work that we ought to be ready to cooperate with them and to not let them wait, because while the enthusiasm is high is the time we can get the best results; and the enthusiasm for tick eradication has increased tremendously during just the last year.

Mr. ANDERSON. Mr. Chairman, I understand that a part of the money used in this work is appropriated by other than public corporations; that is, other than by State and county governments.

Dr. MELVIN. Yes; there is a great deal of money that is provided by live-stock associations. In fact, I think the bulk of the money that is provided in Texas is by the counties and by these various live-stock organizations.

Mr. ANDERSON. I have an impression that about three years ago this appropriation was very materially increased with the idea of avoiding the necessity of the department expending other than public funds. I am inclined to think that it is a very doubtful public policy, the one of having the departments of the government expend other than public funds. My impression is that it was the understanding when the increase was made that the department would not expend other than public funds.

The CHAIRMAN. You are incorrect about that, Mr. Anderson. That refers to the field force in the States Relations Service, where it is specifically set out.

Dr. MELVIN. We do not use any funds except those provided by Congress. None of our men receive any money or any expense allowance except from funds provided by Congress. But the States avail themselves of these other funds and pay their men who cooperate with us from those funds.

The CHAIRMAN. I am very glad to have that statement.

Mr. WILSON. Suppose you did eradicate all the ticks down there at one time, would they not come back the next year?

Dr. MELVIN. Not any more than eggs would hatch without the presence of the hen or the incubator.

Mr. WILSON. Do you not find the home of the ticks down there in the woods?

Dr. MELVIN. Those are other ticks. There is only one particular tick that affects cattle.

Mr. WILSON. I know, but would not the other ticks infect the cattle the same way?

Dr. MELVIN. No, sir.

Mr. WILSON. Then, if you eradicate the tick, you would have this disease conquered?

Dr. MELVIN. When this particular species of tick is eradicated it will be good-bye to Texas fever forever, because these other ticks do not cause that disease.

Mr. HOWELL. Where do these ticks come from?

Dr. MELVIN. It is uncertain.

Mr. HOWELL. Are they indigenous to the country?

Dr. MELVIN. Yes, sir; from this line in the United States clear through to the northern part of Argentina: it seems to be indigenous to all that tropical and semitropical country.

Mr. MCLAUGHLIN. You mean, do you, that in these freed areas there will be no ticks in the future unless they are brought in from outside?

Dr. MELVIN. Exactly.

Mr. MCLAUGHLIN. You free these places in such a way that they will stay free unless the tick is brought in from the outside?

Dr. MELVIN. Yes, sir.

Mr. MCLAUGHLIN. And you know that there are none left there [illegible]?

Dr. MELVIN. We make just as certain as possible that they are all removed.

Mr. MCLAUGHLIN. That is the purpose of your work?

Dr. MELVIN. If there were any left behind, it would only be a question of one or two seasons until they were propagated sufficiently for us to know of their presence again.

The CHAIRMAN. If you have completed that statement, I would like to ask you about the $75,000 appropriation here in that same item for stock demonstration work, in cooperation with the States Relation Service, in areas freed of the cattle tick. Tell us a little something about how that work is done and what you hope to accomplish by it. There is an increase there of $25,000.

Dr. MELVIN. Yes, sir; that has been carried on with the view of encouraging live-stock improvement in those freed areas, and it has resulted in the bringing into those sections a large number of beef and dairy cattle. Many creameries have been started in sections freed of ticks. Many bulls have been brought by communities into the eastern part of the South. Several neighbors will buy a good bull and use him in common.

Mr. MCLAUGHLIN. Has any part of this appropriation been used for the purchase of animals for breeding or for any other purpose?

Dr. MELVIN. No, sir; it is practically extension work in the improvement of animal breeding in these sections.

Mr. MCLAUGHLIN. An appropriation not unlike this was made for use down in Texas, and it was put into the law that no money should be used for the purchase of breeding animals; but the department construed that literally, and while no money was used for the purchase of breeding animals they bought animals for every other purpose under the sun.

Mr. ANDERSON. Doctor, is similar work carried on under any other appropriation?

Dr. MELVIN. Similar to this extension?

Mr. ANDERSON. Yes.

Dr. MELVIN. Yes. Work similar to that is carried on under the animal-husbandry appropriation—demonstration work, lecture work, the pig-club work, and the poultry-club work. It is all of a somewhat similar nature, although it is not as restricted as this is.

Mr. ANDERSON. What I had in mind was whether or not it would be desirable to put all extension work of this character under a single item.

Dr. MELVIN. I do not think it would, because certain lines of this work must be kept under the organizations best adapted to handle them. In dairy-extension work no organization would be so competent to handle it as the Dairy Division, while the animal-husbandry work and feeding-demonstration work is best handled by our Animal Husbandry Division.

Mr. HAUGEN. I would like to ask, Doctor, to what extent your bureau cooperates with the farm-management, the farm-demonstration, and various other investigational and demonstration forces in the department which are carrying on work throughout the country?

Dr. MELVIN. They cooperate to a considerable extent. We have a committee in the Bureau of Animal Industry, for instance, authorized to confer with the States Relations Service and to pass over to them whatever information their organization can use. For instance,

Mr. HASKINS. Any ordinary veterinarian could carry out your orders in the eradication of the tick.

Dr. MELVIN. We would not take an ordinary veterinarian, a man just entering our service, and send him out on tick-eradication work not until he had had thorough instruction and experience under other trained men. We would not consider it safe to do so, although he may know all of the essential features of tick eradication.

Mr. HASKINS. Now, then, after this man has been prepared and has had instruction, what other work can he do in the field of all the work carried on by the department? What other work is assigned to him?

Dr. MELVIN. As a general proposition, this work that is assigned to him is sufficient to keep him busy from morning to night. We try to keep him busy all of the time on this particular work, and he has no opportunity to take up other lines of work, as a rule.

Mr. HASKINS. I am not criticizing this bureau, but I think the records will bear out the statement that you will find you have a large number of people in a small area in certain sections of the country and that their energy is directed on different lines. My contention is that there could be more cooperation and a saving of money. The leader of the majority reminded us that it is the duty of every Member of Congress now to scrutinize every appropriation; and, in order that the minority may share its responsibility with the majority, it must guard against this waste of appropriations. And I take it we should have the information, and, if we can find places

here and there where we can save a million or two, it might be worth while to do so.

Mr. McLAUGHLIN. That is right in line with the position I have taken before this committee two or three times.

Mr. HAUGEN. The question has often been asked, to what extent do the bureaus cooperate, and we have been told that they are doing that. Now, I would like to know something definite, to have something pointed out definitely where this cooperation takes place. I have been unable to get that information to satisfy myself—that there is really cooperation between the bureaus—and I honestly believe there is an unnecessary waste of expenditures. It is not enough to say to Congress and to say to the people that there is cooperation. This committee ought to be able to point out to Congress that there is cooperation; that this bureau is doing a certain line of work and is cooperating with the others. It is not enough for this committee to say to Congress, "Why, there is cooperation." That is not definite information. We should be furnished with information.

Mr. McLAUGHLIN. Can we not go further than that in respect to this particular work? Men are employed under the Lever Act to go into these localities and advise and assist the farmers, and they ought to be the kind of men who can make proper suggestions as to the breeding of cattle and how to raise hogs, and so on. They may not be technical men, able to establish a creamery and direct its successful operation, and I do not believe that men under this appropriation ought to be required to do that; that ought not to be expected of them.

My idea is that when money is provided to send a county agent into a county he ought to be able to do all kinds of work, including this, and this ought not to be necessary; and if the Lever Act does not provide money enough to engage the right kind of men let that money be increased and get the right kind of man and send him in there. But I would not send one man under this appropriation to teach how to feed cattle, another man under another appropriation to teach how to raise potatoes and corn, and perhaps another man to go in there and teach how to organize the boys' corn clubs and pig clubs and girls' canning clubs. Under the one appropriation I would have a man capable of doing all that kind of work, and it seems to me reasonable that one man should be employed to do all that kind of work. And the committee will remember that I opposed the appropriation a year ago on the same ground.

The CHAIRMAN. Yes; I recall.

Mr. McLAUGHLIN. I am opposed to sending different men in there when their work may conflict and three or four men will be doing the work one man could do.

Mr. HAUGEN. And, Mr. Chairman, I take it the doctor will admit that the items enumerated by the gentleman from Michigan could be done by practical, experienced men, who had knowledge of the matters to be taken up and considered.

Mr. McLAUGHLIN. If the Lever Act does not provide money enough let it be increased.

Dr. MELVIN. The capacities of men are limited, and I think if you find sufficient work for one man to do, and he has that work to do and he does it, that is all you can expect of him. If you would expect

him to neglect part of one work in order to take up parts of many other kinds of work, that is only doing the work, to my mind, in a haphazard way. If a man has sufficient time to devote to several subjects and he is competent to handle those subjects, that is all right; but where he has sufficient work of one kind to do, let him do it. If he is plowing corn, let him plow it, so long as he has enough corn to plow, and do not let him undertake to plant potatoes at the same time.

Mr. McLAUGHLIN. But you would not send a man down there to teach how to plow corn and another man to teach how to plant potatoes—two men, one to direct one kind of work and another another. And don't lose sight of the fact that there is a limit to the activities of the Government. The Government can do a lot of things, but is it called on, or should it be called on, to do all of those things?

Dr. MELVIN. That is not a question for me to answer.

Mr. DOOLITTLE. How many jack-of-all-trades have you in your department, Doctor?

Dr. MELVIN. Well, we are trying more and more to specialize on our work, rather than to have a diversity of opinion in various offices.

Mr. DOOLITTLE. I think you are quite right.

The CHAIRMAN. It seems, gentlemen, that this is a matter of department policy, and I am inclined to think we had better defer a discussion of it until we have the Secretary of Agriculture himself before the committee, because otherwise you may embarrass these people who are subordinate to him.

Mr. McLAUGHLIN. I was trying to find out if there is any work those employees or officials do under this appropriation that could reasonably be done by men who are going there anyway employed under another appropriation.

The CHAIRMAN. As I understand this appropriation, Dr. Melvin, it provides for the employment of those who have a higher scientific and expert training than the average county agent employed by the States Relation Service under the Lever Act, and the duty or the work of these men employed from this fund is rather for the purpose of instructing the county agents on a particular problem. Is that about right?

Dr. MELVIN. Yes; that is about right.

The CHAIRMAN. In other words, the men employed under this appropriation are, in fact, the connecting link between the scientific information that you gather here in Washington and in the various State experiment stations and the man who is in immediate contact with the farmer, the county agent. Is that about right? That has been the impression I have gotten from it.

Dr. MELVIN. I think that is a fair presentation of it.

Mr. OVERMYER. And I know, Mr. Chairman, that the county agent in our county under the Lever Act already has more work than it is possible for him to do. It is a physical impossibility for him to do more work than he already has.

Mr. McLAUGHLIN. Still, do you not think the Government is going as far as it ought to go in the matter of supplying that man to [illegible] in [illegible]uctions to the farmer?

[illegible]ER. Suppose some special emergency should arise there [illegible]ne was not familiar and would not have the ability to

deal. Should the department be debarred from sending a man there who would be competent and able to take care of that situation?

Mr. STEELE. You have a dip formula for eradicating these ticks, have you not?

Dr. MELVIN. Yes, sir.

Mr. STEELE. A regular formula and instructions for the dipping of these cattle?

Dr. MELVIN. Yes, sir.

Mr. STEELE. Now, would it be possible for you to send me with that formula and instructions down there to some place to dip a bunch of cattle? Do you suppose that I could carry out those instructions intelligently and eradicate it? Do you not think it is possible I could do so?

Dr. MELVIN. While I think you could, I think there are lots of people who could not.

Mr. STEELE. Now, these men about whom Mr. McLaughlin is talking—if they had that formula and there were ticks in the neighborhood, could they not instruct these people just what to do with this formula?

Dr. MELVIN. I think the necessity is to have this work taken up in a comprehensive way by everyone within a given area, in order to get definite results. If the county agent or anyone else would go down and give instructions, tell them how to dip their cattle, and what to dip them in, they might have certain results, and he would go away. One man here might do it, and another man there might do it, but there would be no uniform action and they would never get rid of the ticks, because there always would be someone who would be indifferent and who would not do it. If you are going to have any appreciable results, the work must be done in a systematic and permanent way, so as to cover all the territory you decide to work in.

Mr. STEELE. Under the Lever act, each county is given $10,000, I understand.

Mr. MCLAUGHLIN. $10,000 for each State, and then an additional amount if the State will duplicate it.

Dr. MELVIN. This tick eradication must be done under close, careful supervision, or you might as well throw your money into the sea; because there will always be enough infection to reinfect the farms that have been cleaned up.

Mr. STEELE. What Mr. Haugen's and Mr. McLaughlin's and my idea is is that you are lapping over, it seems to me. Of course, I have not gone fully into this, but it looks like a lap-over to me.

Mr. HAUGEN. Mr. Chairman, I would like to have the doctor make himself clear. The Chairman asked the question if it required special skill and science to do this work of eradication of the cattle tick. It seems to me that it ought to be possible for the doctor to give us this information.

Mr. MCLAUGHLIN. Undoubtedly; but the statement that Mr. Lever made I understood to be with reference——

The CHAIRMAN. To the use of this $75,000.

Mr. MCLAUGHLIN. In the areas freed from the tick.

Mr. HAUGEN. I am speaking about the eradication of the ticks.

The CHAIRMAN. My statement did not apply to that, Mr. Haugen, at all. My statement applied only to demonstration work provided

for in the item by an appropriation of $75,000. We had completed the consideration of the eradication of the tick, pure and simple, and had then taken up the sum of $75,000 for demonstration work in tick-freed areas, and I was trying to get an idea from Dr. Melvin as to just how that work was being done.

Mr. HAUGEN. Well, we are still on the proposition, and that is what I want to get at. I should dislike very much to have to go out into the country and say that one of the bureaus here contends that it requires special skill and science to do the work of dipping to eradicate the tick when every man in the backwoods is doing that sort of thing and has been doing it for a quarter of a century.

The CHAIRMAN. Dr. Melvin's statement would not bear that construction, taken in connection with the question I asked him.

Mr. HAUGEN. I am not talking now about tick eradication, but about the duplication of the work.

Dr. MELVIN. I do not think there is any duplication of the work, because the only money that is being expended by the department on this work is confined right to this appropriation. There is no other bureau of the department that I know of that is spending any money specifically on tick eradication so that there can not be any duplication of the work in this particular field.

Mr. HAUGEN. Then we will get down to cooperation, which is just where we started. In the eradication of the tick the dipping can be done by the average veterinary surgeon, and it is hardly necessary to send two veterinarians to one place to do practically the same thing—one to eradicate the tick and the other the scabies, or whatever it might be.

Mr. ANDERSON. Mr. Chairman, the idea that I had in mind when this discussion originated was this: A year or two ago the department reorganized itself with the idea of coordinating the different work, so that the same class of work could largely be done under one supervision. Now, it seems to me that this provision, item 54 here, providing an appropriation of $75,000 for stock demonstration work in the Southern States, gets away entirely from that reorganization. What I had in mind to ask was whether or not it was not desirable to put this $75,000, if you are going to appropriate it at all, into some other item so that there would be the same supervision of that item as there is under other demonstrations and not have what amounts to a special division or branch, under the Bureau of Animal Industry to carry on this sort of demonstration when the other sort of demonstration is carried on under some other bureau of the department.

The CHAIRMAN. You will note, however, Mr. Anderson, that the demonstration work under consideration must be done in cooperation with the States Relations Service. I understand from Mr. Harrison, who is private secretary to the Secretary of Agriculture, that the policy of the department is to concentrate more and more under the States Relations Service the various extension activities of the scientific bureaus, so that as their scientific information is gathered together and is ready to be made available to the farmer it will be disseminated through the States Relations Service working in conjunction with the extension departments of the State agricultural colleges. I take it, therefore, from the statement of Mr. Harrison, which will be discussed in more detail by the Secretary when he

pears before the committee, that the department is working gradu-
y to the line of thought you have in mind.
Mr. ANDERSON. That is all very satisfactory, but it does seem to
) that the practice of making these little provisos in items of this
ıd leads directly away from that plan.
The CHAIRMAN. Unless they are connected up, as this language
nnects this up with the disseminating agency of the department,
ıich at the present time is the States Relations Service.
Mr. ANDERSON. Why not put the item right under the States Rela-
n Service, where it belongs?
The CHAIRMAN. I can see an objection to that, although this is
ıide the question. I can see this objection to it, that your men who
ə trained along certain lines—for instance, in beef-cattle feeding,
the establishing of creameries, in milk production, and the like of
ıt—are naturally specialists, and those men are a part of the organi-
tion of the Bureau of Animal Industry and ought to be controlled
that organization; so that they do not get away from the scientific
d of it at all. But when they come to act as disseminators they
ən can act under a connection which ties them up to the States
ılation Service on the one hand and the Bureau of Animal Indus-
y on the other hand. I can see some force in that. It may not be
nclusive at all.
Gentlemen, that completes that item, I presume, and this afternoon
3 o'clock we have agreed to hear Mr. Rommel.
Dr. MELVIN. Either Mr. Rommel or Dr. Dorset, just as you prefer.
The CHAIRMAN. I would prefer to hear Mr. Rommel, so as to take
) the items in the sequence in which they occur in the bill.
(Thereupon, at 12.25 o'clock p. m., a recess was taken until 3
ılock p. m.)

AFTER RECESS.

The committee reassembled at 3 o'clock p. m., pursuant to the taking
recess.

'ATEMENT OF MR. GEORGE M. ROMMEL, CHIEF OF THE ANIMAL HUSBANDRY DIVISION, BUREAU OF ANIMAL INDUSTRY.

The CHAIRMAN. The next item, gentlemen, is on page 42 of the
ɔok of Estimates, and is item 56, "For all necessary expenses for
vestigations and experiments in animal husbandry." Mr. Rommel,
ho has charge of that line of work, is here and will present a state-
ent concerning it.
Mr. Rommel, I have been trying to get, as nearly as I can, for the
ımmittee and for the record, and for the House also, a complete
atement of the various lines of work in the department. Tell us
ıiefly what you are doing now, how much money you are expending
ı your different projects, what you expect to do in the future, and
ɔw much money you expect to expend under this appropriation for
ch particular line of work. For instance, "For experiments in ani-
al feeding and breeding, including cooperation with the State agri-
ıltural experiment stations, including repairs and additions to and
ection of buildings absolutely necessary to carry on the experi-
ents, including the employment of labor in the city of Washington

and elsewhere, rent outside of the District of Columbia, and all other necessary expenses."

Now, will you just adopt that suggestion and take up and discuss your various lines of work?

Mr. ROMMEL. Mr. Chairman, possibly it might be well in following your suggestion to discuss these in the order in which we have our records at the department.

The first item which I have on this list is an item of $500, which is our share in the stores of the bureau; that is to say, stationery and similar materials; we contribute that much annually to the bureau's stock room.

The next is administration, an item of $10,700. That includes the general expenses of administering the work of the Animal Husbandry Division.

The CHAIRMAN. And that is all of the overhead charges for that purpose?

Mr. ROMMEL. The overhead charges; yes, sir. Animal-breeding investigations, $5,660. That is the work which we are doing in studying the inheritance of animals, the principles of breeding in domestic animals, using laboratory methods, and endeavoring to work out the principles underlying those phenomena. The project, as many of you know, is largely thus far a study of inbreeding. We have carried this on for almost 10 years, mating the animals as closely as it is possible to mate them—full litter brother and sister, whenever we can get them. If this material is not available, we breed the son back to his dam, or vice versa. We now have some families of guinea pigs of which there are about 16 of these inbred generations; and we are now working to determine the effects that have been produced. The value of this work to the practical breeder, of course, is that the practical breeder, particularly the man who is endeavoring to establish a herd of pure-bred animals, is, you might say, compelled to resort to inbreeding to get anywhere. Yet we all know that there are disastrous results that may come from ill-advised inbreeding; and what we are endeavoring to do is to determine how far these results may be obviated.

The CHAIRMAN. So far you have not reached any general scientific rule which you can lay down?

Mr. ROMMEL. We have not. But we hope that within a year or two we may be able to say that we know more about this subject than we have known heretofore. We have been hampered so far, somewhat, by not having the right sort of man, you might say, to put his entire time on it; but we have recently obtained a man who was trained in one of the best institutions of the country along this line, and he has been engaged since the first of September in a thorough study of the work that has been done during this period.

Mr. HAUGEN. What can you tell the committee as to the results obtained in inbreeding so far?

Mr. ROMMEL. The results that we have obtained so far indicate, apparently, that there has been a marked fixity of type; that is to say, that the animals have been bearing, as time goes on, a closer resemblance to each other; there is a more fixed type than when we started. There appears to have been some decrease in fecundity; there appears to have been some decrease in size; but I am not con-

vinced that that appearance is based on proper mathematical deductions. I am a little afraid that a statement I made to the committee two or three years ago in regard to that will not be borne out by a proper mathematical study of this thing. Fortunately, the man we have on this work now is a skilled mathematician as well as a genetist.

Mr. HAUGEN. You have not got far enough along to make any definite suggestions?

Mr. ROMMEL. None, except this: The use of inbreeding is a safe practice, provided——

Mr. HAUGEN (interposing). For strong types?

Mr. ROMMEL. Yes, sir; it is a safe practice provided you do not mate two animals with similar defects, or in whose ancestry appeared the same defects. That is a pretty safe rule to follow.

Mr. HAWLEY. Has there been any decrease in vitality or intelligence of the animals?

Mr. ROMMEL. I do not imagine there has been any appreciable decrease in intelligence, but there has been in——

Mr. HAWLEY (interposing). Of course, the intelligence of a guinea pig is not very high to begin with. Now, what would you say as to the vitality?

Mr. ROMMEL. I was going to say that the tests that have been made as to vitality so far appear to indicate that there is a decrease in vitality. For example, we have made one test—we tested the seventh generation; we have not yet tested the fourteenth generation. In testing the seventh generation, we find that the inbred pigs succumbed to tuberculosis more quickly than did normally bred pigs. And that would appear to indicate that there was some decrease in vitality. At the same time, it is an open question whether that was a fair test.

The point I am trying to make is simply this, that we are on the threshold, you might say, of scientific research investigation, the application of scientific method to the study of inheritance in breeding animals; and methods that 10 or 15 years ago we might have regarded as satisfactory methods we may find on further study to have been anything but satisfactory.

Mr. STEELE. Are you trying this on cattle also?

Mr. ROMMEL. No, sir; we are working with laboratory animals. The studies that have been made on cattle are studies that have been made by using the herdbooks or obtained by other study and observation.

The CHAIRMAN. All right; will you take up your next line of work?

Mr. ROMMEL. The next line of work is pork production; more properly speaking, swine investigations. The experimental work on that is also carried on at the experimental farm of the bureau near Beltsville, Md. This work is principally a study of the value of forage crops in the ration of the pigs and of their effects on the quality of the meat produced.

Mr. STEELE. May I interrupt you a moment? I see you have these lines of work divided; what item are you talking about?

Mr. HAWLEY. He is speaking of note "a." under item 56.

Mr. ROMMEL. Yes; but these notes only show the increases.

Mr. STEELE. You are dividing it differently from the way you have it here.

Mr. ROMMEL. I am following the Program of Work of the department.

The CHAIRMAN. Mr. Steele, you will find that work referred to on page 60 of the Program of Work of the department.

Mr. ROMMEL. That is the most convenient way for me to present the work, in order to conform to the chairman's request, and I am following that here.

I will say, for your information, that this outline I have followed is somewhat different from what appears right there in the book. Now, I can indicate to the committee as I go along just how these changes come about.

Take these swine investigations at the top of page 60 of the Program of Work. The estimate of the department on this item is $10,000, which is an increase of $4,260. That is largely to study the effects of the value of forage crops in feeding pigs and the effect of these crops on the quality of meat produced. That is a question of extreme importance to hog raisers everywhere, but especially in sections where feed such as peanuts and alfalfa are largely used. Both of these feeds apparently have an effect on the quality of pork that must be overcome before the hogs will command the top prices on the market. Peanuts make extremely soft pork, and in alfalfa regions there is some objection to alfalfa for a pig forage.

The CHAIRMAN. What effect does alfalfa have? Does it have a softening effect on the pork also?

Mr. ROMMEL. It has a softening effect also, so they say; I do not know; I do know that peanuts will have that effect. I have never gone into experiments with alfalfa.

The CHAIRMAN. Does that affect the flavor of the pork?

Mr. ROMMEL. No. That is a peculiar thing; the flavor of the pork is not affected, but the pork is made soft by peanut feeding; peanuts make a very oily pork, which drips when hung up.

Mr. LEE. How long does it take to remove that condition?

Mr. ROMMEL. Apparently three or four weeks. That is one of the problems we have tried to work out at Beltsville under this item. This work has an extremely important bearing on the organization of pig clubs, because we have to tell these boys belonging to the pig clubs that the rations which we are recommending have a scientific basis.

Another line that we are studying at Beltsville very thoroughly, and which we will go into more thoroughly if we are permitted to have an increase in this item, is the study of the effect of cottonseed meal on hogs. This is one of the mysteries of animal feeding; and it is not known yet whether it can be overcome. There has been no method so far devised by which it is safe to feed hogs a ration of which cottonseed makes a part. We have studied this and I think we have made some progress; but whether we will be able to solve the problem, time alone will tell.

The CHAIRMAN. What effect do you get from the feeding of cottonseed meal to hogs?

Mr. ROMMEL. The man who is feeding his hogs on a ration in which there is some cottonseed meal is likely to go out into the pen

in the morning and find one or more hogs dead. We have found in our study that there is never a case where a hog dies from cottonseed-meal poisoning where there have not been symptoms; but they have been so slight that the average farmer would overlook them.

The CHAIRMAN. Symptoms of what?

Mr. ROMMEL. Of cottonseed poisoning. A pig never dies from cottonseed-meal poisoning unless he has previously shown signs of sickness; but they may be such signs as only a careful observer would notice. That, of course, makes it out of the question to feed cottonseed meal to hogs. If you are going to have some of your hogs die on your hands, it will knock out your profits.

Then, the disease may take another form. The pig may become sick and may not die for a long time. In cases like that a change of feed will effect a cure. In these chronic cases, the first indication of sickness is the roughness of the coat of the hog; the coat gets harsh and the hair begins to curl up, and the pig is plainly unthrifty. By and by, he begins to stagger in the hind legs, and possibly there may be a little characteristic thumping of the flanks. Anyone who knows the disease of little pigs called "thumps" will recognize that; it is the same thing; it is a rapid, characteristic movement of the diaphragm, that causes the flanks to thump. The pig may go along in this way for a long time and become emaciated, and eventually may die.

In those acute cases resulting in death that I have witnessed there is no sign whatever of paralysis. The pig may show no signs of being sick, except indications that would be noticed on keen observation. He is seized with a very sudden attack; there is marked shortness of breath; the pig is in great pain and squeals, and, if the attack does not pass off, he may die in 28 to 30 minutes. Death results from cardiac failure and suffocation.

Mr. HAUGEN. Is that due to an overdose, or is there safety in giving that feed to hogs in a limited quantity?

Mr. ROMMEL. I have not found it so.

Mr. STEELE. You would not recommend it as feed for hogs?

Mr. ROMMEL. No, sir.

Mr. HAUGEN. It is generally fed to cattle, is it not?

Mr. ROMMEL. Oh, yes; it does not affect them, except when it is fed in very heavy amounts and for a considerable period of time; it can be fed to cattle for from three to four months with safety, in very heavy rations, such as they feed in the South.

The CHAIRMAN. Does this cottonseed meal have any effect on pregnancy in hogs?

Mr. ROMMEL. Yes, sir; a sow that is fed on a heavy cottonseed-meal ration will probably have a litter of dead pigs.

Mr. STEELE. How much have you assigned there for that work?

Mr. ROMMEL. There is an increase. The total is $10,000. The increase is $4,260.

Mr. STEELE. Until you do determine that scientific problem should you not issue a bulletin warning all those who are feeding hogs not to feed with cottonseed meal.

Mr. ROMMEL. We have done that. As a matter of fact, with a few exceptions, nobody feeds hogs on cottonseed meal now; they know better.

Mr. CANDLER. What effect does an overfeeding of cottonseed meal have on cattle?

Mr. ROMMEL. If cattle are fed on cottonseed meal from three to six months, with a ration of from 4 to 7 pounds of cottonseed meal a day, they in time become affected; the eyes become watery and discharge freely; sometimes the cattle become blind, and often they become lame.

Mr. STEELE. Two pounds a day, I believe, is the ration with the northern feeders.

Mr. ROMMEL. Two pounds a day is perfectly safe for cattle.

Mr. STEELE. And we can continue that from four to six months.

Mr. ROMMEL. Oh, yes; you can continue indefinitely.

Mr. HAUGEN. How does it affect people?

Mr. ROMMEL. Well, it has not been used enough as human food for one to be able to tell; the oil is the only form in which cottonseed products go extensively into human food.

The CHAIRMAN. Take up the next line, please.

Mr. ROMMEL. The next is for pig clubs, $27,500, carrying a net increase——

The CHAIRMAN (interposing). Where is that in your program book?

Mr. ROMMEL. That is on page 64.

The CHAIRMAN. Suppose you tell us briefly about your pig-club work.

Mr. ROMMEL. The pig-club work is organization work supplementing the corn-club activities of the department and of the States.

It was started in 1910 in Louisiana, in Caddo Parish, under the inspiration of a man by the name of Jones. Mr. Jones was, I believe, at that time the county superintendent of schools in Caddo Parish, and he organized the first pig club in the United States there.

The next year the State university took it up, and the following year, 1912, they induced the Agricultural Department to go into it. The work has been enlarged until now there are 13 States in which there are pig-club agents of the department working in cooperation with the States Relations Service of the department and with the State agricultural colleges. These agents are missionaries of good pig raising in their States. Their work is to select certain counties—no more counties than they can properly cover—and organize pig clubs among the school children in those counties. They endeavor to teach the county agent the principles of pig raising, so that eventually he can take it up and the State agent can go elsewhere and organize other counties.

The CHAIRMAN. That is an important statement. Right on that point let me ask you this: Your man does not come in direct contact with the farmer so much as he comes in direct contact with the demonstration agent on the ground; he teaches the agent, and the agent teaches the farmer. Of course, necessarily in some instances he comes in contact with farmers' organizations at club meetings and similar places, but his primary duty is to teach the agent, is it not?

Mr. ROMMEL. That is the theory of the thing, Mr. Chairman. As a matter of fact, we have not been able to follow that theory in all

cases. We have in some States and in some counties been able to find county agents who could be so taught. But the demand on these county agents is so tremendous that probably in a majority of cases we are not able to reach that ideal. But that is the ideal to which we are working. Does that answer your question?

The CHAIRMAN. Yes; that answers the question.

Mr. HAUGEN. You speak of the county agent. Who is the county agent? Will you make that clear for the record?

Mr. ROMMEL. The county agricultural demonstration agent in the county; a branch of the extension force of the State——

Mr. HAUGEN. Where the Federal Government is cooperating with the States?

Mr. ROMMEL. Yes, sir.

Mr. WILSON. Who is the man that you have down there?

Mr. ROMMEL. That is a man of the Animal Husbandry Division, qualified in hog raising.

Mr. WILSON. Is he on the statutory roll?

Mr. ROMMEL. No, sir; not on the statutory roll; he is on the lump-sum roll; he is an officer of the Department of Agriculture. One or two of these men are paid a small amount in addition by the States. As a general rule we pay the salary of the men and the State pays the traveling expenses and furnishes his office and the clerical assistance. It is a little less than dollar for dollar cooperation. The State, as a rule, puts in a little more than the department does.

Mr. WILSON. Is he under the civil service?

Mr. ROMMEL. Not all of the agents are.

Mr. WILSON. Are any of them under civil service?

Mr. ROMMEL. Some of them; yes, sir; a few of them. These men, as a rule, are appointed after consultation between the State and the department; the man must be satisfactory to both parties.

Mr. STEELE. Now, just how do you encourage those boys in the pig clubs? Does the boy pick out 10 pigs, or do you allot so many pigs to each boy in the neighborhood, and then do you weigh those pigs at a certain time? I want to know the nature of the pig clubs. I suppose you have a competitive line there, have you not?

Mr. ROMMEL. Yes; I can explain that.

Mr. STEELE. I wish you would do so.

Mr. ROMMEL. These clubs, as I said before, were organized as an outgrowth of the corn clubs throughout the country. In those clubs the boys were being encouraged to raise more corn. Then the question arose, what they were going to do with it. So it was suggested that pig clubs be formed, and the pig clubs were organized for the boys and the girls—for we could not keep the girls out of it.

Each one is expected to get one pig. If it is a pure-bred pig, all the better. The pig is then weighed under the direction of the leader of the club, who may be a school teacher, a banker, a preacher, or what not.

The boy agrees on joining the club to render a report at stated intervals on the progress of that pig. These reports are sent in to the county agent, who in turn sends them in to Washington. We have a record of all those boys who have rendered reports. At the end of a year the reports are collected and a certain formality is gone through in the awarding of prizes, which it is unnecessary to detail

here because it would take too much time. They may bring these pigs to the county fair and decide which is the best pig: they may not show the pigs at all: they may decide, for instance, on which boy has followed the best method. Then winners at the county fair in a State may go up to the State fair and exhibit there. At the Louisiana State Fair, held at Shreveport last year, there were over 200 pigs from the pig clubs exhibited: and a year or two ago the private breeders there got together and petitioned the authorities of the State fair not to permit the pigs of the boys' and girls' clubs to be exhibited in the open classes, but the fair authorities refused to exclude them.

Mr. HAWLEY. Why was that requested?

Mr. ROMMEL. Because they knew that they would get beaten occasionally by the pig-club members.

Mr. WILSON. These boys and girls of the pig clubs have the best pigs, do they?

Mr. ROMMEL. Very often they have the best pigs.

Mr. WILSON. Where do they get the pigs?

Mr. ROMMEL. From breeders.

Mr. WILSON. Do they buy them?

Mr. ROMMEL. They buy them.

Mr. WILSON. Then the Government and the State have nothing to do with the purchase of the pigs?

Mr. ROMMEL. Not a thing, except as we may advise them.

Mr. WILSON. But you do not pay any of the price?

Mr. ROMMEL. No, sir.

Mr. HAUGEN. It is largely a question of selecting the right pig to begin with?

Mr. ROMMEL. Yes; it is largely in selecting the right pig.

Mr. HAUGEN. Who selects the pigs for them?

Mr. ROMMEL. The pig is supposed to be selected by the club leader. The county agent may also select them. The State pig-club agent may select them; anybody who knows a good pig when he sees it may help.

Mr. HAUGEN. It would be difficult to select 200 pigs of the same quality, for instance, if there were 200 in the contest?

Mr. ROMMEL. Certainly.

Mr. HAUGEN. Are allowances made, then, for the inferior grade of some of the pigs?

Mr. ROMMEL. The whole thing is not based on the winning of these pigs at the show. It is based partly on that and partly on the care with which the boy keeps the records, and other things of that sort.

Mr. HAUGEN. It is not the number of pounds gained?

Mr. ROMMEL. Not entirely. As far as that point is concerned, I think I should say to the committee that we have the most remarkable contrast in pigs that were litter mates, one being raised by a member of a pig club and the other raised by a neighbor or by the member's family. We have pigs that would probably weigh about 50 or 60 pounds at 9 or 10 months which were raised by the father of the member of the club, while the pig-club member may have a pig weighing 200 pounds at the same age.

Mr. HAWLEY. Are you prepared to take up this work with any State that makes the application?

Mr. ROMMEL. No, sir; we have not the money.

Mr. WILSON. Is this money specifically applied to the Southern States?

Mr. ROMMEL. No, sir; we have pig-club agents in North Carolina, Georgia, Alabama, Kentucky, Louisiana, Texas, Arkansas, Oklahoma, Massachusetts, Indiana, Nebraska, Oregon, and California.

The CHAIRMAN. Is it possible that you have overlooked South Carolina? [Laughter.]

Mr. CANDLER. And Mississippi?

Mr. WILSON. How about Illinois?

Mr. ROMMEL. Illinois is establishing pig clubs by State efforts, and, so far as I am aware, they have never requested a pig-club agent.

Mr. HAUGEN. It is all in the grade of the pig, is it not?

Mr. ROMMEL. It is all in the way it is fed and its breeding; you can not make an underbred pig gain like that.

Mr. WILSON. Well, I have seen hogs down there in Georgia that I did not think weighed 200 pounds that were 9 months old or more.

Mr. ROMMEL. Yes, sir.

Mr. HAWLEY. What strain of hogs have you got at Beltsville?

Mr. ROMMEL. Berkshire grades; they are very high grades.

The CHAIRMAN. If there is nothing further on that, will you take up your next item?

Mr. ROMMEL. The next item is beef-cattle investigations. That is on pages 60, 61, and 62 of the Program of Work.

Mr. HAUGEN. Did I understand you to say that you had men in the States to instruct the State agents?

Mr. ROMMEL. Yes, sir; they are part of the extension force; these men are part of the extension force of the State. This is our contribution to the organization of pig clubs. The State pays the traveling expenses and the clerical expenses and furnishes the offices. We pay the salaries.

Mr. HAUGEN. That is, the men you send out from your bureau?

Mr. ROMMEL. Yes.

Mr. HAUGEN. And the Government also contributes toward paying the expenses and the salaries of the State agents or the county agents?

Mr. ROMMEL. These men are part of the extension organization in the State.

Mr. HAUGEN. Do they simply go into the district to instruct the agent?

Mr. ROMMEL. They have to both instruct him and——

Mr. HAUGEN (interposing). As a matter of economy, would it not be better to instruct him right here on the experiment farm—all those agents—before they start in on the extension service or the county service?

Mr. ROMMEL. Of course, that would mean that the agents would be taken away from their regular duties.

Mr. HAUGEN. Would it not be better to appoint county agents who are experienced men equipped for the work before they start in?

Mr. ROMMEL. You could not get them; they are not available.

(Thereupon there was an informal discusion which was directed by the chairman to be omitted from the record.)

The CHAIRMAN. That was a good statement you made out of the record, Mr. Rommel, and I wish you would repeat it for the record.

That is, differentiate between your county agents operating under the extension funds proper and these men that you send from Washington headquarters as pig-club leaders, for instance, in the States.

Mr. ROMMEL. Do you wish such a statement for the record?

The CHAIRMAN. Yes.

Mr. ROMMEL. The statement, then, is simply this: There is, under the extension program, a demand for a large body of men who are peculiarly trained to do a peculiar work. Many of these men have to be trained. In many sections of the country county agents are employed—for example, in the South—who are familiar with the ordinary details of farming operations, but who lack, in many cases, an expert's knowledge of live stock. Therefore the Government has been assisting the States to meet the demand by supplying them with expert advice on live-stock subjects, the organization of pig clubs being one of these features.

The CHAIRMAN. I think that is a very clear statement of the situation.

Mr. LESHER. Where can a man get this training that you speak of?

Mr. ROMMEL. You have to take him and train him. We bring our pig-club agents to Washington for instructions. The training that the county agents get from our men is in the regular meetings they have at stated intervals and by actual personal contact.

Dr. MELVIN. In the State.

Mr. ROMMEL. In the State, yes; the county agents get together every now and then in the State.

Mr. HAUGEN. How are they selected? What consideration is given to the knowledge of farming and practical things in their selection?

Mr. ROMMEL. These pig-club agents?

Mr. HAUGEN. Yes; are you simply selecting men with a lot of theories stored away? Are they people that have practical knowledge of the duties assigned them, or are they selected from colleges, with no knowledge whatever of the duties assigned to them?

Mr. ROMMEL. These men are graduates of agricultural colleges, as a rule——

Mr. HAUGEN. Very good, so far.

Mr. ROMMEL (continuing). Who have been specially trained in animal husbandry, and whose knowledge of pigs and whose interest in pigs is their principal interest in live stock.

Mr. HAUGEN. I am speaking of their knowledge of pigs; what knowledge have they of pigs? Are they farm boys?

Mr. ROMMEL. Yes, nearly all of them are farm boys; I can not say that all of them have been raised on the farm, because I do not know the early history of all of them.

Mr. HAUGEN. What knowledge have they of the pigs, just what they have learned from seeing them at the experiment stations?

Mr. ROMMEL. The training that they have received in their agricultural college course and the experience that they have had subsequently, in addition to such experience as they may have had on the farm.

Mr. HAUGEN. Where? On the farm, or where?

Mr. ROMMEL. Either in college work or on the farm.

Mr. WILSON. What salary do you pay them?

Mr. ROMMEL. These men get from $1,380 to $1,920; the average is around $1,500.

The CHAIRMAN. Will you take up your next item?

Mr. ROMMEL. The next item is beef-cattle investigations, $23,000. That is an increase of $5,000. The beef-cattle investigations have been in progress for 11 years.

In that time we have established the practice of summer feeding of cattle in the Southern States; we have put into effect the feeding of calves in the Southern States. We are studying now the feeding problems we find in the Appalachian region. If the increase recommended is made we will continue investigations and cooperation with the Kansas experiment station on the study of inheritance in Shorthorn cattle. That project has been taken up to study the inheritance of the beef-making and the milk-producing function in the most popular breed of beef cattle which we have in the country—the Shorthorn.

It is a fact that, in any study covering a period of years, at any given exhibition of live stock you will find that comparatively few of the notable prize winners have had prize winners for sire and dam. For example, in the Shorthorn breed (possibly in other breeds, but certainly in the Shorthorn breed) the grand champion bull at the International Live Stock Exhibition at Chicago very seldom has had a grand champion for a sire or a grand champion for a dam.

The question, therefore, arises: Is not our standard of selection of our beef cattle based on faulty conclusions? If this is the case it is high time to change it. The theory underlying this project is that the milk-producing function of the dam has a great deal more to do with her ability to produce beef type than any of us have realized; a Shorthorn cow which was a high milk producer probably was not an outstanding individual from the standpoint of beef type.

Mr. HAUGEN. You can assert that as a positive fact, can you not? It is not necessary to say "probably"? It is an absolute fact, is it not?

Mr. ROMMEL. I would not care to say so; no, sir. I would not care to say so in all cases, because I do not know it.

There is a further point there. If we grant your point, Mr. Haugen——

Mr. HAUGEN (interposing). Well, I have listened to quite a number of experts on the subject, and I did not know that that was a controverted fact. I supposed that was generally conceded; at least, it has been by everybody that I have conversed with and in all the lectures that I have listened to.

Mr. ROMMEL. All right. If it is a fact that the animal selected to head the cow herd is a poor milk producer, she is going to produce a poor calf, is she not?

Mr. HAUGEN. I understood you to have reference now to the production of fat; and my understanding now is that it is generally conceded that the cow does not give fat to both the pail and the back; if it is a cow of the milk strain, the fat goes to the pail, and if it is a cow of the beef strain it goes to the back.

Mr. ROMMEL. The Shorthorn as a breed is known as a dual-purpose breed; and the point I made was a point on which I think you

That is ... a heavy milker would ... to go into a beef-cattl ... s a good milker would b ... alf; and, if the cow that ... good calf it follows that sh ...

... pplication to that. If this theo ... rofound effect on range practi ... man goes through his herd and c ... em. It is an open question wheth ... not been the producers of the best calv ... own fact that ranchmen are continua ... ality of their herds is difficult to mainta ... ight; will you take up your next line?

... The next is horse and mule investigations, pages ... book.

... The study of horse and mule raising and feedin ... That is the first item, the study of horse and m ... project is about to be closed out. That was the w ... carried on at the experimental farm at Beltsvi ... the relative economy of raising and feeding mules a ... luding a study of various rations for each.

The CHAIRMAN. You say that you have now about reached so ... conclusions on that?

Mr. ROMMEL. We have about closed that out. Whether we v ... have anything of value or not will be determined later. We w ... endeavoring to determine how far the farmer could raise hor ... on rough feed, with practical elimination of grain. We w ... endeavoring to get these data with the idea of applying them ... regions where grain was excessively high in price—New Engla ... for example, and similar regions. As far as we have gone ... indication is that the common practice in the corn belt is sou ... that is, if you want a good horse you have to give him grain.

The next item is the breeding of horses in cooperation with ... Colorado experiment station, where we are studying the product ... of horses of carriage type, particularly those suitable for gene ... purposes on the farm. That work is now beginning to show resu ... It has been in progress for a long time; and naturally results h ... been slow. But we have some remarkable individuals there; st ... lions weighing up to 1,400 pounds, and mares reaching a wei ... of 1,300 pounds, the mares averaging in weight from 1,050 to 1, ... pounds. That type of horse is one which is extremely valuable ... the average farm.

The CHAIRMAN. Your proposed expenditure on that is $7,9 ... is it?

Mr. ROMMEL. Yes, sir; there is no increase in that item at t ... there is no increase in any of these horse items.

Mr. HAUGEN. You are breeding Percherons here on the farm. ... you?

Mr. ROMMEL. We have some Percherons.

Mr. HAUGEN. Have you any other breeds?

Mr. ROMMEL. We have some light driving horses: a few Morg ... that we use for driving purposes.

Next is the Morgan-horse item, set forth in the program book on page 65 as "Breeding horses under New England conditions." That statement needs some revision. The proper title should be, "Breeding Morgan horses." That work is going on in Vermont on a farm owned by the department, and is progressing nicely. The stallions there are valuable for service in the community, and some of them are also used in the breeding work in cooperation with the War Department.

Mr. STEELE. Do you have a service fee for those horses?

Mr. ROMMEL. Yes; we have a service fee for the stallions there at the farm. The fee for the horses used in the military project I will explain later, if I may defer answering your question.

The CHAIRMAN. I presume both of these items, the one in Colorado and the one in Vermont, are practically indeterminate projects, are they not?

Mr. ROMMEL. Practically; yes, sir.

The CHAIRMAN. They are really research projects?

Mr. ROMMEL. They are really research projects. The work on draft horses has no allotment. That is in cooperation with the Iowa experiment station. No expenditure is proposed there. That work is still in progress, and some good individuals are being obtained.

The next item is the breeding of horses for military purposes. There is a change in the wording of the bill, but no change in the amount carried. The suggested change by the department is that this should be worded as follows: "Experiments in the production of horses suitable for agricultural and military purposes," the idea being that the phrase as originally carried in the bill did not express the purpose of this work.

This work was started several years ago and was devised not only to encourage the breeding of horses of the type that would be satisfactory for military purposes but that would be exceedingly valuable for farm purposes in the section where the stallion stood. Stallions of four breeds have been used.

Mr. MCDERMOTT. I see you have 45 stallions there. How are they divided?

Mr. ROMMEL. Thoroughbred stallions, Standardbred, Saddlebred, and Morgans.

Mr. MCDERMOTT. How many of each kind?

Mr. ROMMEL. During the breeding season of 1915 the number was as follows: Thoroughbreds, 11; Standardbreds, 10; Saddle, 9; and Morgan, 7.

The horses stand in Vermont and New Hampshire, Virginia and West Virginia, and Kentucky and Tennessee at public service without charge for a service fee, provided the farmer gives the Government an option on the colt at $150 during the year it is 3 years old. We permit the farmer to cancel this option at any time by paying the stipulated service fee of $25.

Mr. MCDERMOTT. I was in the stockyards this summer, and I saw representatives of the different Governments of Europe buying horses. They paid all the way from $150 to $300 for some of these horses, and they did not look like they were fit for army purposes—big, heavy, full horses.

Mr. ROMMEL. They got just a fair grade of horses.

Mr. McDERMOTT. What kind of horses make the best type of army horse for army remounts?

Dr. ROMMEL. Army officers say that they want an active, mobile horse which has a good, well-coupled back and good, clean legs; a horse weighing from 1,000 to 1,200 pounds.

Mr. McDERMOTT. What is your opinion on the matter? From which breed of horses can you make up one of that description?

Mr. ROMMEL. I think we can get that type from all four of these breeds.

Mr. HAUGEN. In the contract you referred to with the farmer, does the Government obligate itself to pay the $150?

Mr. ROMMEL. It does not; but if the Government does not take the horse it charges no service fee; the farmer has the colt and does not have to pay a service fee. If he offers the horse to the Government and it does not purchase it, that relieves him from the necessity of paying for the service.

Mr. HAUGEN. In other words, the owner of the dam has the option of selling a scrub colt for $150, and if it is not accepted by the Government at $150 he gets the service for nothing? Is that the substance of it?

Mr. ROMMEL. Except that we do not breed scrub colts.

Mr. HAUGEN. Well, I take it that any kind of a stallion will breed some scrub colts?

Mr. ROMMEL. The mares are all selected; we are getting a higher average for our stallions than the ordinary stallion would get. Here is a record I wish to present, Mr. Chairman:

In the year 1913, 1,550 mares were bred; in 1914, 2,011 mares were bred; and in 1915, 2,158 mares were bred. The average number of mares bred per stallion in 1913 was 38; the average number in 1914 was 47, and the 1915 the average was 58. We have had to reduce the number of stallions every year, because our appropriations have been reduced. The farmers are breeding more mares every year, and each stallion is having to take care of more mares every year, because the farmers believe this is a good plan.

Mr. STEELE. I would like to ask how many horses you have bought?

Mr. ROMMEL. We had out the first year 44 stallions.

Mr. STEELE. I mean how many horses under this contract you spoke of.

Mr. ROMMEL. Under this particular plan only a very few, because they will not be available until next spring in any sufficient numbers. The Army bought, I understand, all the few that were available last year from the first experimental breeding season. This year they are planning to buy all that are available. Next year there will be a considerable number of colts available, so that the next year will tell how this thing will come out.

Mr. HAUGEN. Can you give the number of colts?

Mr. ROMMEL. I can not.

Mr. HAUGEN. Can you give an estimate? You stated the number of mares, but can you give the number of colts?

Mr. ROMMEL. I can not give that.

Mr. HAUGEN. Can you give an estimate? Is it about 50 per cent?

Mr. ROMMEL. I presume my estimate would be nearly that. I would not care to put that in the record.

Mr. HAUGEN. Can you have the figures put in the record?

Mr. ROMMEL. I think I can.

Mr. LEE. The cost and the receipts?

Mr. ROMMEL. For the fiscal year 1915 the appropriation was $30,000, and with that $30,000 there were 2,158 mares bred. The cost was slightly less than $14 per mare, if I am correct in my figures.

The CHAIRMAN. You have how many stallions?

Mr. ROMMEL. Thirty-seven stallions.

Mr. LEE. That is self sustaining then?

Mr. ROMMEL. That is pretty cheap service.

Mr. HAUGEN. But you did not collect for all of them? Did you collect for standing colts, or so much for service?

Mr. ROMMEL. The Government is giving the service on these colts at a cost of about $14 per mare. That is about an average. As a matter of fact the fee on these horses would ordinarily be a great deal higher than even the optional charge which we are making. We have one stallion, for instance, that has never served for less than $1,000 or $1,200. He was never available to the public. No farmer ever had a chance to breed to him. The service fees for the other stallions would range from a minimum of $25 upward to $50, or even more.

Mr. WILSON. That is not the general service fee, is it?

Mr. ROMMEL. That was the fee of the thoroughbred Henry of Navarre. Such horses stand at a very high fee purposely to limit the number of mares that should come to them.

Mr. HAUGEN. It hardly seems fair to give service for a fee of $25 which is worth $1,000.

Mr. ROMMEL. We did not pay anything for that horse. He was presented to the Government and put in this work. Here is some information that may answer Mr. Haugen's question, from the annual report of the Chief of the Bureau of Animal Industry for 1915.

Record of stallions in Army horse-breeding work.

District.	Breeding season.	Number of stallions used.	Mares bred.	Living foals.	Aborted or dead foals.	No foals.	Mares died.	Not reported.
First	1913	7	279	93	24	148	.....	14
	1914	9	299	126	.....	.....	.....	173
	1915	7	[1] 260	.....	.....	.....	.....	.....
Second	1913	22	848	264	24	257	.....	303
	1914	23	966	376	.....	.....	.....	590
	1915	18	988	.....	.....	.....	.....	.....
Third	1913	12	423	182	30	198	13	.....
	1914	11	749	220	22	57	4	446
	1915	12	883	.....	.....	.....	.....	.....

[1] Estimated.

You will observe that the number of living foals appears to be exceedingly low, and I will explain that in just one sentence. The farmers thought that here was a chance to breed the old mare and that it would not cost them anything, and we had a large number of barren mares brought to us. We had absolutely no means of determining whether they were barren or not. We know this to be the case, because so few of these mares have foals by their sides. That is the reason the number of living foals is low.

Mr. WILSON. Do you not think you ought to select the mares yourself?

Mr. ROMMEL. We do select the mares.

Mr. WILSON. You did not there.

Mr. ROMMEL. Yes, sir. The only thing we can not determine though is whether the mare has been a producer or not. You can guess at it, but you can not determine it. These mares were all selected mares; they have to be sound, and it is specifically stated just what unsoundness will bar them.

Mr. STEELE. You take a man standing a stallion or two stallions in a neighborhood and he gets a larger percentage of foals than that. He informs himself whether those mares are barren or not.

Mr. ROMMEL. Our percentage of foals is growing with our acquaintance in the community. When a man first goes into a community he does not know. Our percentage is increasing.

Mr. STEELE. Do you take these stallions and place them out in different districts?

Mr. ROMMEL. Yes; they were placed in these districts and they go back if conditions prove satisfactory. We try not to go to districts where privately owned stallions are. In other words, we see no reason why the Government should compete with the privately owned stallions, so we stay out of districts which are well supplied.

Mr. STEELE. A practical stallion man going into a strange neighborhood does not get this low percentage of foals. He selects his mares with a good deal of caution, because he has to guarantee a foal.

Mr. HAUGEN. Forty per cent is a fair average, is it not?

Mr. ROMMEL. Yes, sir.

Mr. WILSON. You are below 40 per cent?

Mr. ROMMEL. Yes; on living foals in some cases; but you find the percentage is increasing as time goes on. In the second year it is better than in the first. We have no report on this year's work. This is really only a report on two years' work, and that is my explanation.

Mr. HAWLEY. Your statement there shows a number which have not been reported. There may be some foals in that number?

Mr. ROMMEL. There may have been some living foals. We will check up on that. They can not beat us. We have got a system so we are sure to get the colt and follow it up if there is a colt.

Shall I proceed, Mr. Chairman?

The CHAIRMAN. Your language there is changed so as to include "production of horses suitable for agricultural purposes."

Mr. ROMMEL. Yes, sir.

The CHAIRMAN. My recollection is that the idea of this item here was to breed horses for military purposes solely, and my recollection is that this item was put into the bill upon a statement made by Gen. Aleshire before this committee some years ago. I am not sure if the item was not put in on the floor of the House. Do you happen to recollect?

Mr. ROMMEL. The item, as I recollect, was put in in conference.

The CHAIRMAN. Now, Doctor, what is the purpose here in extending this language to include the production of horses suitable for agricultural purposes in addition to military purposes? Is it your plan to extend this work gradually through the country, from State to State and county to county, placing Government stallions to breed

horses best adapted to farm purposes? What is your general idea? What have you in mind yourself?

Mr. ROMMEL. Of course, I can not speak for Gen. Aleshire, but I can say this, because I was one of a committee which drew this plan in cooperation with the War Department: That no plan of this sort should be put into effect that is worked out solely with the military idea; that we can not ask the farmers of this country to breed horses solely for military purposes. But we took the position that we could ask them to breed a horse that would be useful for military purposes and at the same time would be useful for agricultural purposes; and that has been the plan in every selection that we have made—to select a horse that can be studded in a farming community which would produce a colt that would be useful in the farmer's general work and that, if the Army needed it, would be useful as a military horse.

Here is the thought: The average farm in this country supports somewhat less than four horses. We had on the 1st of January, as nearly as we can estimate in round numbers, 24,000,000 horses in the United States, of which 21,000,000 were on the farm. There are in the neighborhood of 6,000,000 farms in this country. Therefore, the average number of horses on a farm does not exceed four. The man who has an average farm on which there are no more than four horses can not afford a tractor, neither can he afford an automobile, neither has he sufficient mares to warrant him in keeping a stallion. Therefore, he is dependent, if he wants to breed horses, on such stallions as may be found in his neighborhood. He is compelled to have horses on his farm that he can use, not only in his farmwork but on the road as well; hence, on the average farm a rather light type of horse is necessary.

I am not speaking of the sections that produce most of our horses. I am speaking of the section that has most of our farms. And in this section we do not, as a general rule, find a good grade of stallion available for public service.

If the farmer has at his command a stallion to breed to that will produce a colt that will be useful in his work—if he knows that that stallion is as it is represented to be—then he has a guarantee which he can not get ordinarily from the privately owned stallion. Furthermore, if the Government has a system of breeding, such as this, it has a supply of horses to draw upon, if need be, that will be far superior to anything which we have had in this country before.

I am speaking now, gentlemen, from what I have learned of the actual working of this plan. We have had a small experiment in this matter, with only one or two stallions available, that showed that these horses would produce a high grade of colts. We know that. Of course, they would, because they were the kind of horses that I was speaking of that have stood at prohibitive service fees. We have now colts in large quantities that are coming two years old in these sections where our stallions have been standing, and we know and the farmers in those communities know that this is money well spent by the Government of the United States.

Mr. MCDERMOTT. I was going to ask you in reference to the horse Henry of Navarre; first, about how his colts compared——

Mr. ROMMEL. They are splendid colts, but not so big as others. Henry of Navarre is a small horse and not as popular as a stallion

to some others because he has not the size. The most popular stallion we have in Virginia is the old horse Omagh. He was bred to over 80 mares last spring.

The CHAIRMAN. As I understand your proposition, you would have in lieu of the appropriation now furnished by Congress a system of breeding which would practically cover the entire agricultural section of the country. You would have stallions in counties, townships, and communities because it would hardly be fair to one section of the country to confine this work to that section while other portions would demand it. Is that the plan you have in your mind, or do you expect to confine this work largely to the stallions that you have already established?

Mr. ROMMEL. I have not been quite so ambitious as that, Mr. Chairman. The farthest I was permitting my mind to go in the matter was to meet the present demands of our military service on a peace basis. What we want to do is to educate the farmers in horse breeding and give them opportunities to breed to sires that are sound—that have nothing covered up. Whether we would want to carry the work to the extent you have outlined, I am not the man to say, not for an instant. I would not suggest that.

The CHAIRMAN. I am not combating your theory; I am trying to get your viewpoint on the proposition. Now, then, your proposition is that you would like to have this work extended so as to provide for the military necessities of this country upon a peace basis?

Mr. ROMMEL. Yes, sir.

The CHAIRMAN. That would involve, at a rough estimate, say, how many more stallions?

Mr. ROMMEL. On the present basis 100 stallions would be required.

The CHAIRMAN. That would involve, at a rough estimate, say, how much?

Mr. ROMMEL. Of about a maximum of $100,000 a year. It would require more than that to start it, but our estimate was that for the entire plan, with 100 stallions—the Government purchasing all the stallions—the initial expense would be $250,000 and that the maintenance expense annually, allowing for the replacement of horses that may have become incapacitated, would be $100,000. In the light of our experience, I think that we were a little high in that estimate.

The CHAIRMAN. That is the point I want you to bring out.

Mr. HAWLEY. I should like to ask the doctor a question. I have gone through the Oregon State Fair exhibit of horses. They have a large number of barns there. The principal horses they have there are Percherons, Belgians, and Shires, as I remember. I think there has been one Standardbred exhibited there for five or six years and one Morgan. The farmers there in that agricultural country are breeding the heavier horse because they find him more serviceable on the farm, and, if they have a surplus, they get a better price for them in the city markets as draft horses. I do not quite see why these four breeds of horses here should be produced to the extent that they are while the heavier draft horses, which are more useful on the farm on account of their weight and strength, receive little attention. The farmer needs less of these draft horses than he would of the other. Four of them will make a good team

where five or six of the small horses would be required. Without producing them to a similar extent, it would aid the farmer to get the heavier horse that he desires. I should like to have you comment on that phase.

Mr. ROMMEL. That is where the military feature comes in. The heavier horse you have described is not suitable for military purposes.

Mr. HAWLEY. I understand that.

Mr. ROMMEL. And if we are going to get suitable military horses, we must consider that point. In the first place, the stallion must be placed in a section where that type of horse is more suitable than the heavy draft horse, and, in the second place, we must get good size in the breed that we select. There are plenty of sections in the country where the draft horse is not the desirable horse.

Mr. HAUGEN. Is it not a fact that both heavy and light horses are required in the Army, in the Artillery?

Mr. ROMMEL. They use no draft horses. No horses with draft blood in them are used if they can avoid it.

Mr. HAUGEN. How does it come, then, that the warring nations are purchasing heavy horses and buying very few of the others?

Mr. ROMMEL. They are taking what they can get. They can not get anything else.

Mr. STEELE. But they take just a certain type.

Mr. HAUGEN. They come out through our country, and if we show them an 1,100-pound horse they will not look at it; they want a horse weighing 1,400 or 1,600 pounds. That is what we call a draft horse in our country.

Mr. ROMMEL. Those are horses bought to use for transport and for moving siege guns. Our Army bought some of those horses, too, but they did not have any draft blood in them. They were heavy Standardbred horses, and that horse, if you can get him, is the best sort of horse for average farm work.

Mr. HAUGEN. Another thing; is it not a fact that there are several sections in this country that are peculiarly adapted to the raising of horses as, for instance, Missouri is for mules?

Mr. ROMMEL. Yes, sir.

Mr. HAWLEY. It is profitable to raise horses in certain sections of this country and unprofitable in other sections. Take, for instance, the immediate vicinity of Washington at the present time. I take it that no one growing corn would think of feeding his corn to hogs or cattle when corn is worth $1 a bushel, hogs 6 cents a pound, and cattle 5, 6, or 7 cents. It would be an unprofitable business. But when you get into the corn section of this country corn brings only one-half of that price, and it is more profitable; not always profitable, but more profitable than here. Therefore is it fair for the Federal Government to say to these people, "You have got to use these horses"? Is it not best to leave it to the people of a particular vicinity or locality to determine for themselves whether they will produce their own horses or market their oats and corn, to decide for themselves which would be the most profitable? Are we not now forcing this industry upon certain localities that are going into it very reluctantly?

Mr. ROMMEL. That has not been our experience. Our experience is that we can not meet the demand.

Mr. HAUGEN. Of course, you can not meet the demand if you give service worth $1,000 for $25, but that is very unprofitable from a business standpoint.

Mr. ROMMEL. But we are not in all cases giving service worth $1,000 for $25. I simply mentioned one horse we had that had stood for that. The service of these horses is ordinarily established at $25 and up.

Mr. HAUGEN. I understand you wish to go into this business and contend that the department should purchase more horses. Here is the proposition: You say it costs on an average $14 for the service fee. To guarantee a standing colt, the average expense would be upward of $50 a colt, when the farmer can get the service fee for $20 and $15. It does not seem necessary for the Federal Government to throw away $30 for every service fee when the service fee can be had for $10, $15, or $20. It does not seem to be a profitable proposition for this Government to engage in the business at a loss of say $30 on a colt.

Mr. ROMMEL. I simply wish to point out, Mr. Chairman, if I may, that I have called attention to the fact that we started out with a lower number of living foals than we have reason to expect; that the number is increasing as time goes on; and that if we get the normal number of living foals, which we have every reason to expect, it would then make a service fee that is very reasonable considering the quality of the horses.

Mr. HAUGEN. What would you consider the normal?

Mr. ROMMEL. I believe we decided some time ago 40 to 50 per cent.

Mr. HAUGEN. That would make it a little over $30?

Mr. ROMMEL. That would make it approximately $30, if we do not do better than this year.

The CHAIRMAN. What are you doing with the stallions that die or go out of service; are you replacing them?

Mr. ROMMEL. No, sir; we can not replace them. Our funds will not permit it. We had one presented to us a few months ago, but otherwise we are not replacing them.

Mr. LEE. I was under the impression that the race-horse people were offering you these stallions.

Mr. ROMMEL. We have had some given and some offered that we declined, because we did not feel that we had sufficient money to support them.

Mr. MCDERMOTT. Do you not think you ought to ask for enough money here now to support that feature of the work?

The CHAIRMAN. You may take up your next item, Doctor.

Mr. ROMMEL. The next item is the subject of poultry investigations. You will find that on page 67 of the work program.

The CHAIRMAN. Tell us about that, please.

Mr. ROMMEL. We have there an estimated increase of $2,500 for poultry investigations. The total for investigational work is $19,840. That work is carried on, as the work statement indicates, largely at the experiment farm at Beltsville. It includes a study of the feeding of poultry, which study has been carried on with similar rations for a period of nearly three years now. We also have the breeding investigations, and in those investigations are trap nesting the hens. If this increase in the appropriation is made available, all the hens

at the farm will be trap nested. The request for the increase is largely to supply assistance needed to take care of the records of the trap nesting. I will say, for the information of the committee, that no birds are kept at the experiment farm at Beltsville that possess a disqualification under the rules of the American standard of perfection.

The egg yields of the hens are, of course, being studied right along, and we have succeeded already in producing male birds of high excellence that would win if shown in competition, which were out of hens that had a record of 200 eggs per year.

The CHAIRMAN. What is the highest record of egg production per year?

Mr. ROMMEL. I do not know, sir.

Mr. HAWLEY. We have a hen out at the agricultural experiment station in Oregon that produced, on an average, an egg a day.

Mr. ROMMEL. I believe Lady Eglantine laid 314 eggs.

Mr. LEE. What do you mean by a trap nest?

Mr. ROMMEL. A device in front of the nest which works so that when the hen gets on the nest she releases a trigger, is trapped in the nest, and has to stay in until she is let out. A man goes at intervals through the day and observes the nests which have been trapped, opens the trap, takes out the hen, makes a record of her number and of the egg she laid. It is simply a scheme to get actual records of the eggs that the hen lays. We have a very simple trap which we use at the farm, and for which a public patent has been requested.

The CHAIRMAN. What do you do with those chickens? Do you sell any of them?

Mr. ROMMEL. We have not sold very many. Surplus chickens that are worth using for breeding purposes have been sent to communities where we have poultry clubs—where poultry clubs are being organized. We are working to get a flock of high degree of excellence, and we have not been sending out breeding stock to any extent.

The CHAIRMAN. Do you study diseases of poultry?

Mr. ROMMEL. No, sir; we are fortunate in not having had them to study.

The CHAIRMAN. The department is studying that?

Mr. ROMMEL. The bureau is studying that.

The CHAIRMAN. I was wondering if anybody had discovered any reason why young turkeys, about 8 or 10 weeks old, dropped dead when they appeared to be apparently well, as mine did all last summer.

Mr. STEELE. This chicken industry is a large industry, and I am interested as to just what you are doing in regard to breeding these hens to make a breed that will lay eggs every day. You are carrying that on, are you?

Mr. ROMMEL. We want to get a hen that is just as good as possible, of course. We are finding some curious things in egg laying. For example, it has been noticed that a hen will lay an egg a day for four or five days, perhaps; then she will stop for two or three days and then start in again. There is a sort of rythmical movement there which is very curious.

Mr. STEELE. How can you transmit that information to me, as a poultry man, so I can have them lay every day? That is your object, is it not?

Mr. ROMMEL. I do not know that you can get them to lay every day. I doubt it very much, indeed. If you have a flock of poultry that is averaging 150 eggs a year you have a remarkable flock, and it is the high average in the flock that we are trying to get rather than the high individual record. Individual records are simply cases of forced individuals, and may mean absolutely nothing to the poultry industry.

Mr. STEELE. Another object of this, I suppose, is to tell me how many roosters I ought to have for a certain flock of chickens?

Mr. ROMMEL. Yes; we, of course, have that sort of data. We have a great deal of data—a great many poultry publications. We have issued since 1910 a large volume of published material on poultry.

One of the things which we have done of value in producing sections is the demonstration of the better keeping quality of the infertile egg, which has had quite an effect on the producing sections. It has worked a revolution in many sections. We called attention to the fact that an infertile egg will keep when a fertile egg will spoil in hot weather. Everybody knew that, but for some reason it had been overlooked until our people called attention to it. That led up to this "rooster day" that they have in various sections, which is simply an understanding among buyers to pay the price for hens on a certain day for all roosters presented at the market. The first State to adopt that was Tennessee. Then Missouri came along, and they are now having it in many States. On those days the roosters come in by the thousands, and it clears out of the country a lot of useless roosters that would be the cause of fertile eggs during the hot summer months, directly contributing to the deterioration of eggs from those communities.

Mr. STEELE. That is, there are too many roosters in the flock; is that the idea?

Mr. ROMMEL. Take them clear out. The man who wants to get the top prices for his summer eggs and produce an egg which the buyer knows will not spoil overnight on his hands, that man must keep his roosters away from the hens after the hatching season is over. He has either to kill them, confine them, or sell them. So the "swat-the-rooster" campaign has been started.

The CHAIRMAN. Does your market-egg work conflict at all with Dr. Pennington's work in the Bureau of Chemistry?

Mr. ROMMEL. Not at all.

Mr. HAUGEN. Does age have any effect on the hen?

Mr. ROMMEL. The hen produces more eggs the first laying year than afterwards.

Mr. HAUGEN. How many years will they lay eggs?

Mr. ROMMEL. It is questionable whether it is worth while to keep a hen for laying purposes longer than one year, although there may be some reason for keeping them longer. If the hen is well worth while from the breeder's standpoint, she may be kept. But they give more eggs during the first laying year than in any subsequent year. Probably the best thing is to dispose of her when that period is over.

The CHAIRMAN. Take up the next item, please, Doctor?

Mr. ROMMEL. The next item is poultry clubs, and that, if I may make the suggestion, is susceptible of the same explanation as I made for pig clubs.

Mr. STEELE. Where are the poultry clubs?

Mr. ROMMEL. They are in Virginia, North Carolina, South Carolina, Georgia, Kentucky, Tennessee, and Oklahoma. We have somewhere in the neighborhood of 5,000 members in the poultry clubs and about 10,000 members in the pig clubs.

The CHAIRMAN. I think the committee is familiar with that line of your work. I notice here on page 69 of the Program of Work that you study the incubation of eggs, and I was wondering again if you come into conflict with the Bureau of Chemistry in their work on that?

Mr. ROMMEL. Not at all. This project on the incubation of eggs is in cooperation with the Office of Home Economics of the States Relations Service; we are using the apparatus they have devised for the study of nutrition. It is the only office in the United States, so far as we know, which is equipped to carry on an investigation of this kind, and we hope to be able to learn something about the changes which take place when eggs are run through an ordinary incubator. You know you can set a setting of eggs under an old mother hen and she will hatch the whole lot; it is not at all uncommon, if the eggs are fertile, that she will hatch them all. But fill an incubator with fertile eggs and you are lucky if you get 50 per cent of the fertile eggs hatched; and nobody knows why that is. The chicks die in the shell about the eighteenth day; and whether it is because of want of strength to get out of the shell, or why it is, we do not know.

Mr. WILSON. That is, in the incubator?

Mr. ROMMEL. Yes. The incubator manufacturers would give any sum of money within reason to be able to solve that problem. If we can find what gaseous changes take place in the incubation of eggs, it will be well worth while. I think we shall soon know more about it than we do now, because that machine, the respiration calorimeter, absolutely measures every change of that sort.

The CHAIRMAN. You have also made investigations of turkeys and guineas to prevent disease?

Mr. ROMMEL. This turkey and guinea investigation has been largely made by an assistant assigned to the subject. He started in the North and worked down through the South. He has covered the territory pretty well, and his business has been to get right on the ground and study the habits of turkeys exactly as a naturalist would study the habits of wild birds. There has been little study of a systematic character of the turkey industry. We are also trying to learn whether it is possible so to manage the turkeys as to prevent the losses from the disease known as blackhead.

Mr. STEELE. I should like, for my own information, to know why it is that we can not raise turkeys as we used to 40 years ago.

Mr. ROMMEL. It is on account of the prevalence of the disease known as blackhead, which has been sweeping all over the country and has, as you say, put the turkey business out of commission in a number of sections. It is not known yet why the disease can not be controlled. That is one of the things we hope we shall be able to learn.

The CHAIRMAN. While you are on this poultry business, suppose you discuss your ostrich investigations.

Mr. ROMMEL. A study is being made in Arizona of the ostrich industry. We have an assistant stationed near Phoenix, in the Salt

River Valley. We have a few birds and are studying them to det mine the effects of feed and inheritance on the production feathers.

The career of the ostrich industry in the United States has bee checkered one. We got into this very fortunately just at the ri time; we got some very good breeding stock, and we have a li experiment station where experiments are being made in coope tion with the Arizona Ostrich Breeders' Association at very li expense to the department. As I have said before to this committ it is one of the most interesting breeding experiments that I have knowledge of, and I hope we can get something out of it.

Mr. HAWLEY. Have you succeeded in getting better feathers far, and more of them?

Mr. ROMMEL. Yes; we have. We have been studying the effe of feed on the chicks principally. It takes three years for a bird begin to produce marketable feathers. We have therefore har gone far enough to determine whether these young chicks that h been liberally fed will produce better feathers than those which h been allowed to run.

The CHAIRMAN. All right: take up your next item, please, Rommel.

Mr. ROMMEL. I mentioned poultry clubs. Did I explain that to satisfaction of the committee?

The CHAIRMAN. I think so.

Mr. ROMMEL. The next item is sheep and goat investigations, p 70 of the program. These projects that appear here in the work p gram have been somewhat lumped; so it may be a little difficult follow them. I can say the amount shown here is $19,940. T carries an increase of $5,000 on the project for breeding range she which is the first one on pages 70 and 71. That additional mo is requested to care principally for the increased work which become necessary in our project on the breeding of range sh especially to give us detailed data on the subject. If I may h the time of the committee, I think I can probably illustrate our son for the increased estimate by explaining the methods used the work.

We have approximately 1,000 ewes on the range, and each on the ewes is scored at the time of her first lambing. When she her first lamb she is scored on mutton form and weighed. T gives two points. After she is shorn the wool is also scored. E year every sheep is scored on its wool, but the ewes are only scored form and weight at the time of the first lambing. The wool is sc on the basis of market requirements and weight. We take a 10-o shoulder sample of each fleece as a permanent record before fleece is rolled up, so that the fibers are not crumpled. Then scouring tests we take a sample from the side of the fleece. T side samples are scoured, the scouring being designed to show relative proportions of grease and of dirt. Naturally, to keep records on 1,000 ewes, or a flock even somewhat larger, means siderable time in the way of assistance. We have been devo much time to that flock. It has required a great many expen trips from Washington.

Mr. HAWLEY. Where is your flock?

Mr. ROMMEL. It is now at Laramie, Wyo. It will probably be moved over into Idaho later on. We want to put a man in charge of the flock, to have complete charge of the records, and also to meet additional expenses there that will come up.

The second item under the sheep and goat investigations for which an increase is submitted is the one on page 73, classification of wools. That is a close corollary of the other sheep-breeding projects of the division.

Mr. HAWLEY. It is your object in this range experiment to get a hardy sheep that will have a good mutton and fleece yield, is it not?

Mr. ROMMEL. Yes; that is what we are are after. I might say more in regard to the impression which the Corriedale sheep which we imported from New Zealand last year made on us. I can proceed with that before I take up this next specification, Mr. Chairman.

The CHAIRMAN. All right.

Mr. ROMMEL. The Corriedale sheep that were brought from New Zealand (there were around 70 head, as I remember it) landed just about a year ago, and when spring set in (in May) they were taken up to the ranch in Wyoming and were sheared in June. Those sheep are apparently what our western sheep men have been looking for. They sheared as much as 12 to 14 pounds of wool, with short fleeces. Most of them had been shorn in New Zealand in October and November before. They had mutton conformation. Of course, what they will look like after they have been through a western range winter we do not know, but, certainly, just on the face of the thing, from what they showed when we first sheared them, they are remarkable sheep. The sheep are in the department flock, and the studies to be made with them are included in the increase of $5,000.

Mr. HAWLEY. They took naturally to the habitat, did they?

Mr. ROMMEL. Yes, sir. I saw them the first day they started out and they started out like old timers; they bunched up like native sheep and went off with the band as if they belonged there. It was remarkable to see them to do that; we thought they would scatter.

The cross-bred sheep that we are studying are likewise giving us interesting data.

Now, this project on the classification of wools, on page 73, is related closely to the other breeding projects. It has, as far as we have gone, been largely a study of the market demands for wool and the proper preparation of wool on the farm and range. We have brought in the educational feature here as well as the research feature. We are making these studies that I have referred to, and, if this increase is granted, we hope to make more studies of a laboratory character on the shrinkage of wool. We have prepared an exhibit of wools and woolen goods with which a car is being equipped to send to the range States—the wool-growing States—in cooperation with the agricultural colleges. This exhibit will fill the sides of an ordinary baggage car, leaving space in the center for persons to gather. The car has not been put on the road yet, but the exhibit is on its way to Montana. It will probably reach Livingston, Mont., by the last of this week or the first of next. The car will probably be out until late in the spring through the wool-growing States at short courses, sheepmen's gatherings, and so on. The increase there under this project is to take care of laboratory work that we want to do on the shrinkage of wools.

The CHAIRMAN. How much is that increase, Doctor?

Mr. ROMMEL. $2,500.

The CHAIRMAN. Take your next project.

Mr. ROMMEL. The next project is the maintenance of the Beltsville farm.

Mr. HAWLEY. I should like to ask a little about this milch-goat work.

Mr. ROMMEL. That is progressing very nicely.

Mr. HAWLEY. What demand is there for goat's milk?

Mr. ROMMEL. Principally among physicians who have sick persons of various kinds on their hands—babies, etc. There is a great demand from sanitariums, and we recently sent 20 head to New York City, where they are stationed on Staten Island and maintained in connection with the Sea View Hospital. We are getting goats now that will produce around 2 quarts of milk a day for several months and that seems to be a profitable production.

Mr. HAWLEY. You are not making, as far as I can see from your project, any study of Angora goats or goats that are raised for their wool?

Mr. ROMMEL. No, sir; none at all.

Mr. HAWLEY. Are there no questions to be solved in that part of animal industry?

Mr. ROMMEL. We have never had occasion to take it up.

Mr. LEE. What is goat's milk worth per gallon?

Mr. ROMMEL. I do not think you can call it a marketable milk. I do not believe it would be advisable for anybody to try to put goat milk on the market, because you would run a lot of risk of contamination. You would have to bring together milk from a lot of individuals, and it would have to be carefully handled. The best way to take care of the matter, if one wants to use goats' milk for a baby or an invalid, is to get a goat and milk it himself.

Mr. WILSON. What is the difference between goat's milk and cow's milk?

Mr. ROMMEL. There is considerable difference in the chemical analysis. The principal difference is in the physical analysis. Cream will not rise as readily on goats' milk as on cows' milk.

Mr. HAUGEN. One is believed to be more wholesome than the other is it not?

Mr. ROMMEL. Goats' milk is supposed to be, and apparently can be retained by weak stomachs when cows' milk is refused.

Mr. HAWLEY. It is more assimilable?

Mr. ROMMEL. It appears to be. Goats are free from tuberculosis and other diseases. It is very rare that goats have tuberculosis.

The next item is the maintenance of the Beltsville farm, for which no increase is submitted. The farm at Beltsville is our field laboratory for investigational work. We have carried that along and have endeavored to get it drained and fitted up for the investigation work which we have under way.

The CHAIRMAN. I thought you had an estimate here for replacing a barn. Do you wish to speak of that now, Doctor?

Mr. ROMMEL. Yes; I should like to, if I may. We had one of our most expensive buildings consumed by fire on the 31st day of March last. The fire was seen, as I recall, at about 9.30 p. m. It was so

almost the instant that it started. It started in a pile of fodder on the first floor of the sheep barn, at the northeast corner, and there were four men who saw it. They instantly gave the alarm. There was a very high wind blowing at the time, and the wind had been blowing almost during the whole month. There had been no rain whatever during the month, except in the first week—none since the 16th, I know positively—and the barn was a complete loss.

The CHAIRMAN. You do not know how the fire started?

Mr. ROMMEL. We have absolutely no idea.

Mr. STEELE. Did you have it insured?

Mr. ROMMEL. The Government never carries insurance.

Mr. STEELE. I do not know why I should, then.

Mr. HAUGEN. Was the barn covered with sheet iron?

Mr. ROMMEL. No; it was covered with asbestos shingles.

Mr. HAUGEN. But it is my recollection that the walls were of sheet iron.

Mr. ROMMEL. No; it was a frame structure. The basement was reinforced concrete. The structure was frame. The barn, as I say, was a complete loss. It is possible we may be able to use the foundation.

Mr. WILSON. Will you tell us why you do not have any insurance?

Dr. MELVIN. I believe it is the general policy of the Government not to carry insurance on its buildings. Of course, the department follows that policy.

Mr. LEE. How did those asbestos shingles stand the heat?

Mr. ROMMEL. They exploded. They did not burn. It sounded like a cannonade of artillery, I was told. The one value of asbestos shingles would be to protect an adjoining building, and fortunately for us the wind was northwest and the burning barn was on the south side of the quadrangle; otherwise we would have lost every building on the hill.

The CHAIRMAN. What did that building cost, Doctor?

Mr. ROMMEL. That building cost about $8,000.

The CHAIRMAN. You estimate here $6,000 to replace it?

Mr. ROMMEL. We estimate for $8,000. There is already an allotment of $2,000 for buildings at the animal-husbandry farm, and this is an increase of $6,000, making a total of $8,000.

The CHAIRMAN. The barn will cost you $8,000?

Mr. ROMMEL. Yes, sir.

The CHAIRMAN. We are very much obliged to you, Mr. Rommel, for your very interesting statement. The committee will now stand recessed until to-morrow morning at 10 o'clock, when the hearing on the grain-grading and warehouse bill will take place.

(Thereupon at 5 o'clock p. m., the committee took a recess until January 13, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES.
COMMITTEE ON AGRICULTURE.
Friday, January 14, 1916.

The committee assembled at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. We completed item 56, page 42, of the Book of Estimates last Wednesday. We will now take up item 57, on page 43, "For all necessary expenses for scientific investigations in diseases of animals, including the maintenance and improvement of the bureau experiment station at Bethesda, Md., and the necessary alterations of buildings thereon, and the necessary expenses for investigations of tuberculin, serums, antitoxins, and analogous products, $88,020."

There seems to be an actual increase of $5,000 asked for in that item.

Dr. Melvin, you will recall about what we wish you to say on these various propositions; and I would like you to follow that plan in your discussion as nearly as you can.

Dr. MELVIN. May I ask Dr. Mohler to present these items?

The CHAIRMAN. Certainly.

STATEMENT OF DR. J. R. MOHLER, ASSISTANT CHIEF OF THE BUREAU OF ANIMAL INDUSTRY.

Dr. MOHLER. Mr. Chairman, under the general-expense item for diseases of animals for 1917, there is an actual increase asked for of $5,000. The reason for this increase is to conduct more elaborate experiments on poisonous plants. As explained in the note, the apparent increase is $2,080, but considering the transfer from the lump-fund to the statutory roll of one clerk at $1,000 and four laborers at the Bethesda experiment station at $480 each, the actual increase is $5,000. These five men were employed during the last fiscal year, and, in order to comply with the law, we intend to place them on the statutory roll.

Mr. ANDERSON. Right there, I think, you will confirm the position that I took some time ago that in practically every instance where you make a transfer from a lump fund to this statutory roll you are obliged to fill that place with somebody else; that is what you are doing here, is it not?

Dr. MOHLER. I beg your pardon; these men are doing and will do the same kind of work as heretofore. The increase of $5,000 is for another line of work entirely—that is, the poisonous-plant work; and this increase has no connection with these employees at all

The additional funds asked for will not be used to fill positions that are vacated. In fact, it is not contemplated that any positions will be vacated. These men will hold the same positions next year that they hold now; the only change involved is that they will be paid from another roll. The additional sum of $5,000 is for research work on poisonous plants.

Mr. ANDERSON. Well, the net result of it is that you do thus create some additional places; they may not be doing the same kind of work; but the net result of it is a certain increase in the number of positions in the department.

Dr. MOHLER. This sum will be used entirely for the purchase, care, and feed of animals on which to do the experimental work to determine the effect of poisonous plants upon live stock. The positions will remain the same this year as last year. It was absolutely necessary to transfer this clerk and these laborers in order to comply with the provisions of the act of 1911.

Mr. HAWLEY. If you had not asked for an increase for the poisonous-plant investigation, would not such a transfer from the lump fund to the statutory roll result in an actual decrease in your appropriation here rather than an increase of it?

Dr. MELVIN. Yes, sir.

Dr. MOHLER. It would result in a decrease of that appropriation.

Mr. HAWLEY. I understand you to say that the increase here was partly due to those transfers?

Dr. MOHLER. The apparent increase, you see, is $2,080.

Mr. HAWLEY. I see.

Dr. MOHLER. And, taking into consideration the transfer of these men, it makes an actual increase of $5,000.

The CHAIRMAN. I think I understand it myself, but let us get it clear in the record: Suppose you did not ask for any increase whatever in that fund for this poisonous-plant work, and you had made these transfers of which you speak; then there would be shown in this item here a decrease corresponding to the amount of the transfers, would there not?

Dr. MOHLER. Absolutely.

The CHAIRMAN. What you have done here is to transfer those men to the statutory roll from this lump-sum roll; but, in addition to that, you want an increase for other work?

Dr. MOHLER. Exactly so. We are merely complying with the law in making the transfers. It is entirely immaterial to us whether the transfers are made from the lump-sum roll to the statutory roll or not.

The CHAIRMAN. Yes. As a matter of fact, without regard to the increase at all, the transfer does not affect the amount of money spent in any way, does it?

Dr. MOHLER. No, sir.

The CHAIRMAN. It simply affects the roll upon which these men are carried?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. Heretofore they have been carried on the roll known as the lump-fund roll; now, under an act of Congress and in accordance with the desire of this committee and of Congress, you are transferring these people to your statutory roll, where their positions can be set out in the estimates?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. So that there is no change in the amount of money at all: it is simply a change in the roll upon which you keep these men; is that true?

Dr. MOHLER. Exactly so.

The CHAIRMAN. Is that the way you understand it, Mr. Anderson?

Mr. ANDERSON. I think that is correct theoretically: practically, I do not think it works out that way.

The CHAIRMAN. I think it does work out practically that way. I think we are being confused by the fact that these items where an increase in an appropriation per se is asked for show an increase, whereas, as a matter of fact, the sum has been reduced by the amount transferred, although the item itself shows an increase: but that increase is accounted for by the fact that you are asking for a real, genuine increase in the item.

Dr. MOHLER. Precisely. You will remember that we took over this poisonous-plant work from the Bureau of Plant Industry on July 1, 1915.

The CHAIRMAN. Yes: I think the amount was $5,000.

Dr. MOHLER. $8,580. And during the present year we are cooperating with the Forest Service at Salina, Utah, for the purpose of investigating the effect of these poisonous plants upon live stock. It is our desire to increase that work by getting a larger number of animals and cooperating with the Forest Service at Salina, Utah, along broader lines than heretofore has been possible.

Mr. HAWLEY. Have you any stations where you intend to do this poisonous-plant work other than at Salina, Utah?

Dr. MOHLER. Not definitely: we may send men out to different forest reserves to do temporary work.

Mr. HAWLEY. What animals are being poisoned?

Dr. MOHLER. Principally sheep, cattle, and horses.

Mr. HAWLEY. What plants are poisoning them?

Dr. MOHLER. The loco plant, larkspur, lupines, death camas, ragwort, snakeroot, water hemlock, and several other plants that are well known for their poisonous properties.

Mr. HAWLEY. What is your plan of work? Do you seek to find something that will cure the animal if it is poisoned?

Dr. MOHLER. In the first place, there is a difference of opinion as to the poisonous qualities of certain of the plants. The work being done at Salina is to gather quantities of these suspicious plants and to test them out on various species of live stock by experiment feeding of the animals with those plants. Then, when the symptoms of poisoning have developed, the next step is to develop an antidote by experimenting with various lines of drugs. It is to increase that work, for which there is a large demand, that we ask for the increase in this item.

The CHAIRMAN. Let us take these subjects up in the order in which they appear in your program book. I notice on page 74 of your program book that you have, first, supervision of all investigations of animal diseases and the performance of duties common to all this work, $10,000. Then you take up the investigation of rabies, then the serum diagnosis of dourine, then the diagnosis and investigation of diseases of animals confined in the United States Zoological Park, and so on.

I would like you to go over those various items very briefly and tell us something of what you are doing and some of the results that you are accomplishing. I think that will be valuable for the record and interesting to the committee.

Dr. MOHLER. The first item, supervision, provides for the administrative work in the laboratories, as indicated by the assignment of the men—the biochemic division under Dr. Dorset, the pathological division under Dr. Eichhorn, the zoological division under Dr. Ransom, and the experiment station at Bethesda under Dr. Schroeder. The proposed expenditures under this project are $10,000, consisting purely of overhead expenses for the administrative work.

The next item is rabies investigations. The character of the investigations is purely laboratory work, where the expense has been slight. We merely make a microscopic examination or inoculate a few rabbits to determine the existence of rabies from the suspected material sent to Washington for diagnosis. We raise our own rabbits, so there is very little expense connected with it.

Mr. HAWLEY. Do you have charge of the work where rabies develops on the ranges?

Dr. MOHLER. No, sir: only in a cooperative way. The Biological Survey, in its work on coyotes and wolves, is really in charge of that project, and we are merely cooperating with them, having our men attend conferences on the subject and occasionally making diagnoses.

Mr. HAWLEY. I suppose you know that coyotes will contract rabies in the deserts and then bite other animals and even go into small towns and bite human beings?

Dr. MOHLER. Yes, sir.

Mr. HAWLEY. Have you anything to do with that work?

Dr. MOHLER. Only in a cooperative way. The Biological Survey is getting rid of those coyotes under the predatory animals act.

The CHAIRMAN. And you are doing the laboratory work in cooperation with them?

Dr. MOHLER. Yes, sir. We have one or two men at present in the field who attend these conferences. In December they had a conference at San Francisco of the officials of the boards of health of the various States interested. I believe there is another one being held this week at Salt Lake City, and we have a representative there.

The CHAIRMAN. All right; take up the next item, please.

Dr. MOHLER. The next is the serum diagnosis of dourine. This consists of experimental work with the blood of animals sent in from the States mentioned by Dr. Melvin, namely, Montana, Wyoming, and North and South Dakota; and the amount expended last year was $2,263.24.

The CHAIRMAN. And you propose to spend this year $12,000. That is rather a large increase, is it not?

Dr. MOHLER. That increase is in connection with experiments being conducted at the Bethesda experiment station with a number of horses purchased in Montana, in the hope of developing a cure for this disease.

The CHAIRMAN. You have to feed those horses?

Dr. MOHLER. Yes, sir; and the chemicals used in this treatment are very expensive. One chemical, for instance, is 606, or salvarsan, which is also used in the treatment of syphilis in man. It is a very expensive treatment; but by working along the lines of a cure,

using such drugs as 606, we may be able to save considerable funds by controlling the disease with drugs instead of by slaughtering the horses.

The CHAIRMAN. What progress have you made in that work? Have you discovered anything so far that you are willing to give to the public?

Dr. MOHLER. No; the experiments have not been conducted long enough to enable us to reach any definite conclusion. There is one drug, made in Switzerland, called "trixidin," that has proved entirely unsatisfactory in its results. These results were contrary to our expectations. That is the only drug concerning which we have obtained definite results. The animals treated with the other drugs are apparently well; but with a chronic and insidious disease like dourine it is impossible to get results in a short time. One of these animals remained alive for two years and then broke down in a short time.

Mr. ANDERSON. How many animals with dourine have you?

Dr. MOHLER. About 24.

Mr. DOOLITTLE. You say it broke down in a short time; about how long?

Dr. MOHLER. About two weeks after it started to break down it died. The acute symptoms developed after almost two years of latency.

Mr. WILSON. Some of the members of the committee do not know what dourine is; I do not.

Dr. MOHLER. Dourine is an infectious disease that is transmitted solely by copulation. It is similar to syphilis in man, and is also called equine syphilis. It is due to a blood parasite called trypanosoma, which is very similar to the protozoan that causes syphilis in man. That is the reason we have used the treatment now known to be so satisfactory in the treatment of human syphilis. The only known method of transmitting the disease is by copulation; therefore we get rid of the mares, castrate the young stallions, and kill the old stallions in eradicating the disease. You will notice that by this method of handling the disease we reduced it last year by 50 per cent; and we can speak with a great deal of hope of practically complete eradication on account of the single way the disease is spread.

We have had only three or four outbreaks of this disease in the country. The first occurrence was in Illinois, about 1886; it existed there for four or five years, and finally was eradicated. The next appearance of the disease was in northern Nebraska and southern South Dakota, in the Pine Ridge Indian Agency horses, and those in the surrounding country. That was eradicated about 1906. Then we had a little outbreak in Iowa in 1903.

Mr. HAWLEY. How do you suppose it got to that Indian agency?

Dr. MOHLER. It was supposed to have been taken there by a stallion that was sold from this infected area in Illinois.

Mr. WILSON. What part of Illinois; do you remember?

Dr. MOHLER. Bloomington.

The CHAIRMAN. Do you make any blood tests of imported animals at your quarantine stations now?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. So as to detect this disease?

Dr. MOHLER. We do not test all the horses coming in; but we make tests of animals coming from places where we suspect this particular parasite to be present.

Mr. OVERMYER. Is it the Wasserman test?

Dr. MOHLER. No; it is a modification of the Wasserman test. The reason we do not have laboratories for diagnosis out near the centers of infection is that we make the test by working with rats injected with another disease similar to dourine called "surra." We use a portion of the spleen of these rats for the dourine test, and it is necessary to have a large number of these infected rats constantly available. Surra is a disease that is even worse than dourine, so we do not consider it advisable to have these infected rats out in Wyoming or Montana. We therefore keep them in a separate, specially constructed room on the fourth floor of our building here at the department.

Mr. HAWLEY. You say those rats have a disease similar to dourine?

Dr. MOHLER. Yes; they die in four or five days, and then we get their spleens, which are swollen to four or five times the normal size. The solution of these spleens is called the "antigen," which we use in combination with three other solutions to test the blood of those horses which are suspected of having dourine.

Mr. LESHER. Are you able to get 606 in this country now?

Dr. MOHLER. No, sir.

Mr. LESHER. They say it is impossible to get it.

Dr. MOHLER. It is impossible to get it now.

The CHAIRMAN. Take up your next item, please.

Dr. MOHLER. The next item is diagnosis and investigation of diseases of animals confined in the United States Zoological Park. This is in cooperation with the Smithsonian Institution, and the proposed expenditure is about $300. That is merely the partial pay of one man who goes over occasionally to make these post-mortems.

The next is forage poisoning or cerebrospinal meningitis of horses. This is an enzootic disease that is prevalent at different times of the year, characterized chiefly by paralysis of the throat and by a staggering gait. In 1912 it caused great losses among horses in Kansas and Nebraska. It was known as the "horse plague" of Kansas.

Mr. DOOLITTLE. Did you finally decide that it was meningitis?

Dr. MOHLER. Yes, sir; and as soon as the frost started in the fall the disease stopped very abruptly. It was the result of a mold that had grown up on the forage and infected it.

Mr. DOOLITTLE. Did you discover a satisfactory remedy for that disease?

Dr. MOHLER. No medicinal remedy; the most satisfactory treatment is a change of the feed of the animals. If affected animals are out on pasture, they should be brought in and fed on dry uncontaminated feed. When you have changed the feed, the disease stops, and only those animals that have already been infected will contract it.

Mr. DOOLITTLE. What is the percentage of mortality?

Dr. MOHLER. Very high; about 85 to 90 per cent.

The CHAIRMAN. You say the disease is caused by a mold?

Dr. MOHLER. Yes, sir; a mold on the forage or on the grass in the pasture. The first cut of alfalfa in Kansas in 1912 was all right, but the second and third cuts caused the disease wherever the alfalfa was fed. It seems that there was a very hot, humid, rainy spell after

the first cutting of alfalfa had been harvested. This was ideal for mold development, and a great deal of mold appeared on the grasses in the pastures as well as on the second and third cutting of alfalfa.

Mr. DOOLITTLE. Did your department and the State department of agriculture agree as to the cause?

Dr. MOHLER. There were several State departments interested. The medical department of the Kansas State University and the Bureau of Animal Industry agreed; but there were certain factions out there that did not agree among themselves.

Mr. DOOLITTLE. Are you positive in your own mind that you have discovered the cause of that disease?

Dr. MOHLER. No, sir; not the exact cause, because the field of mold life is so large that we have not been able to put our finger on the individual mold that produces it.

Mr. DOOLITTLE. But you are convinced that it is a mold?

Dr. MOHLER. Yes, sir; since it always occurs in connection with feeding moldy food or forage.

Mr. DOOLITTLE. Are you studying that at the present time?

Dr. MOHLER. Yes, sir; we have had a recent outbreak in Virginia and Maryland, and that is why this proposed expenditure is recommended.

The CHAIRMAN. This appropriation is for a continuance of those experiments?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. Take up your next line, please.

Dr. MOHLER. The next is the demonstration of tubercle bacilli in the tissues of cattle that have reacted to tuberculin. The work that is being done is in connection with the interstate shipment of cattle. A certain amount of tuberculin testing is done, and the animals are slaughtered following reaction to the tuberculin test. In cases where it is desired to verify the results of the tuberculin test specimens from the reacting animals are shipped to the laboratory in Washington for examination. The proposed expenditure is about $500.

The CHAIRMAN. All right; take up your next.

Dr. MOHLER. And the same thing applies to the acid-fast bacilli. They are organisms that are similar to the tubercle organisms.

The CHAIRMAN. These are purely laboratory lines of work?

Dr. MOHLER. Yes; purely laboratory.

The CHAIRMAN. The next is producing strains of animals immune to tuberculosis. That is also very important, but you do not appear to be doing much work on it.

Dr. MOHLER. The work done in 1913 seemed to show very conclusively that none of the strains of animals used were immune to tuberculosis. We started out with rabbits, because, if you inoculate a lot of guinea pigs and rabbits, the guinea pigs will die, but very few of the rabbits will die. We expected that we could develop a strain of rabbits that would be immune, but it did not work out that way.

The CHAIRMAN. In other words, you have completed that project?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. Whenever you have completed a project, the committee will be glad to know about it. Take up the next line of work.

Dr. MOHLER. Production of preventive and curative bacterins for takosis of goats. That work has been completed and the bacterin produced to combat this disease has been found very satisfactory. At present there are not many cases of takosis in goats to work on, but we have the bacterin.

The CHAIRMAN. Before we forget that disease, tell us what it is?

Dr. MOHLER. It is a wasting disease, frequently accompanied by a chronic diarrhea, and is due to a little organism discovered in the Bureau of Animal Industry. It is a disease something like tuberculosis, but without any marked lesions of the lungs or any other organs. The animal slowly becomes emaciated and anemic as in any other wasting disease, such as pernicious anemia in man.

The CHAIRMAN. Is it transferable to human beings?

Dr. MOHLER. No, sir.

Mr. WILSON. Is it transferable to other animals?

Dr. MOHLER. No, sir.

Mr. WILSON. Just to goats?

Dr. MOHLER. Yes, just to goats.

The CHAIRMAN. Take up you next project.

Dr. MOHLER. Investigation of means of utilizing city garbage and table refuse. That is work which is just being started, and we have not expended any amount of money so far this year. It is a new project and is being conducted in cooperation with the Animal Husbandry Division.

The CHAIRMAN. I do not know where I saw it, but I have seen the statement somewhere that this garbage might be a source of fertilizers.

Dr. MOHLER. Yes, sir; the Bureau of Soils has that project in hand now, and no doubt Prof. Whitney will tell you about it.

The next item is investigation of infectious abortion of animals, for which an expenditure of $11,100 is proposed. This is one of the most serious diseases of animals in the United States; it is only secondary to tuberculosis. Having learned the precise method of developing the organism, the work we are doing now is to make a vaccine that will prevent it. This proposed expenditure is to purchase animals and make investigations with serums and vaccines to control contagious abortion of cattle.

Mr. OVERMYER. Do you have any publications on that subject?

Dr. MOHLER. Yes, sir.

Mr. OVERMYER. I had an inquiry some time ago from some one in my home who wanted publications on the subject.

Dr. MOHLER. We have three; if you would like to have them, I will mail them to you.

Mr. STEELE. That prevails in the thoroughbred cattle more particularly, does it not?

Dr. MOHLER. Yes; but it is spreading to the range cattle of the West and the Northwest.

Mr. STEELE. Is it not a fact that the people who have those special breeds keep that secret? They do not let you know anything about it; when the disease is present in a thoroughbred herd the man who owns the herd keeps that very secret, does he not?

Dr. MOHLER. Yes; it is to their interest to keep it very secret.

Mr. STEELE. Have you any authority whereby you can go into a man's herd and investigate that, and keep tab on it?

Dr. MOHLER. No, sir; we can not. We do know that in buying cattle for our herd at Beltsville we subjected the selected animals to the test to see whether this disease was present or not. In a majority of pure-bred herds examined we found the disease by a test similar to that dourine test I told you about.

Mr. STEELE. A man in Iowa whom I know has a herd of cattle, and he would like to have that matter investigated in all these thoroughbred herds. He says it is a fact that that is being kept secret by the owners of those herds.

Dr. MOHLER. There is no doubt about that being the way it is spread all over the country. It has even reached the open range, where cattle are dropping their calves when the foetus is four or five months old. The disease also occurs in pigs and sheep and quite frequently in horses.

Mr. HAWLEY. Is it due to the same cause as the disease in cattle?

Dr. MOHLER. No; in horses it is caused by an entirely different organism.

Mr. HAWLEY. Then it is not communicated between the different animals?

Dr. MOHLER. Not between horses and cattle; but cattle, pigs, and sheep will communicate it one to another. Horses are infected with an entirely different germ, but abortion follows in the same manner.

Mr. HAWLEY. If a herd had the disease, or if a man bought cattle from an infected herd and put them with his cattle and the hogs followed the cattle, they would get the disease, would they?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. Have you found any remedy?

Dr. MOHLER. We have been working on a serum and a vaccine, which have been tested on the different Government herds, especially the herd of the Government Hospital for the Insane, and also the herd supplying the boys at Annapolis with milk. We have had very good results, both at Annapolis and at the insane asylum. We tried to make an experimental test at Annapolis by applying the vaccine to one-half of the animals and keeping the other half as controls, but the results were so good that the paymaster wanted the entire herd treated rather than keep half of them for checks or controls.

The CHAIRMAN. Are these Government herds infected in this way?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. You picked them out for that purpose, did you?

Dr. MOHLER. Yes, sir; we knew, by being called in consultation by the Government Hospital for the Insane, that the animals they purchased from certain communities for supplying their people with milk were infected. They buy cattle from different sections of Maryland and Virginia, and it was their experience that every animal brought in pregnant would lose its first calf. Therefore, we tried to protect them by using this vaccine.

Mr. HELGESEN. It must be quite general?

Dr. MOHLER. It is quite general.

Mr. HELGESEN. Is this treatment one that can be used by any man?

Dr. MOHLER. Yes, sir.

Mr. HAWLEY. How do you propose to reach the range herds?

Dr. MOHLER. That is a difficult proposition. Carbolic acid has been used as a medicinal treatment for some years, and the way that treatment has been applied to the range cattle has been to put it in their feed in the troughs. Some stockmen sprinkle it on the salt and let them lick it up.

Mr. ANDERSON. That is not very effective, is it?

Dr. MOHLER. No; it is not satisfactory; but that treatment has been recommended very highly by the French and also in this country.

Mr. STEELE. In my opinion, the treatment to eradicate that disease ought to originate at the breeding farms. It can not be done very readily on the range.

Dr. MOHLER. We have treated about 4,000 cattle down in Texas with vaccine injections. Of course, they are dairy cattle, but they are on the ranch just the same. Our man has just returned from treating these animals, so that it is too early to say what the results will be.

Mr. DOOLITTLE. When you get an animal with this disease from a herd, do you keep the matter secret too?

Dr. MOHLER. If anybody should write to us about it, we would let him know. We frequently have samples sent to us by prospective purchasers for diagnosis, and if we find the disease present we always reply to that effect.

Mr. DOOLITTLE. But you do not make any announcement of a public nature, do you?

Dr. MOHLER. No more than we would in the case of tuberculosis. If anybody asks whether a certain herd has tuberculosis in it, and we know it has, we would say so; but we have no desire to publish broadcast the character of disease in a man's herd, without some reason for giving it out. We do, however, notify the State officials.

The CHAIRMAN. How is this disease transmitted? I notice in your statement in the work program you say that you are trying to find a more satisfactory method of disinfecting contaminated premises; and I was wondering how the disease was transmitted?

Dr. MOHLER. The easiest way is by copulation, the bull being bred to a diseased cow and then serving another cow that is healthy. It is also spread by the discharge from the vagina of infected females. The stable becomes contaminated and the infection will pass down in the gutter of the stable, reaching the external genitals of other animals when they lie down; then they will contract the disease. It is also spread by animals eating infected straw, hay, and forage. The discharge may be dropped on the hay, and if healthy animals eat that hay the disease will spread through the alimentary canal.

Mr. STEELE. You were speaking about tuberculosis. Take the stock yards at Sioux City, for example: A farmer ships in a carload of hogs, as we did once; I think there were 52 hogs, and they were the finest looking bunch of hogs and brought the highest price that day on the market; and I think there were 48 of them that went into the tank. Now, does the Government, after they have found that that is true, follow the shipment through the yards to a man's farm and quarantine him? Can you do that?

Dr. MOHLER. No; we do not quarantine him; we do not go to that extent. However, we have regular forms whereby an occurrence of that kind would be reported to Washington. Then we would notify

the State veterinarian in the case you mention, where 48 hogs were found tuberculous at Sioux City and inform him that they came from Smith, at Waterloo, for instance. When the State veterinarian has been given the information, it is as far as we can go. We do that in cooperation with the State authorities. On the discovery of any disease, we notify the State veterinarian or the live-stock sanitary board in the State where the disease has been found to exist; but we do not publish the fact to the country, or through agricultural papers, in the case of such widespread diseases as tuberculosis and infectious abortion.

Mr. STEELE. Here is what I was trying to get at: Does the State go to work, then, and destroy the man's herd of cattle or his hogs?

Dr. MOHLER. No; they may apply the tuberculin test to the animals on the farm——

Mr. STEELE (interposing). The farmer has always fought shy of an examination of these hogs. They do not want to pay for the cost. They want it arranged so that the people who have the good hogs will bear the expense of those great losses that occur. I was wondering what the different States were doing in trying to eradicate that disease.

Dr. MOHLER. You understand that in Chicago they have to pay the full price, while in little towns, like Cedar Rapids, the packing-house people very frequently buy subject to the post-mortem examination; so that, if the hogs are found to be tuberculous, the farmer loses; but in the markets like Chicago that is not true.

Mr. STEELE. No; it is not true in our market; but at the same time it takes the loss off from the man who raises the healthy hogs.

Dr. MOHLER. That is an injustice to the man who is trying to clean up his herd.

Mr. HELGESEN. Have all the States laws for cooperation?

Dr. MOHLER. No, sir; they have not.

Mr. HELGESEN. Can you suggest any form of law that would make a uniform rule for cooperation with the Government in these cases?

Dr. MOHLER. There was an ideal law suggested at the foot-and-mouth disease conference at Chicago, November 29 and 30, by the State veterinarian of Pennsylvania; that address has been published in a number of papers.

Mr. HELGESEN. Would that cover all these diseases?

Dr. MOHLER. That would cover all these diseases in all the States.

The CHAIRMAN. Do you mean a State law?

Dr. MOHLER. Yes, sir; purely a State law.

Mr. HAWLEY. Do you have cooperative arrangements with the State veterinarians on this disease that causes abortion?

Dr. MOHLER. Not all the States have State veterinarians.

Mr. HAWLEY. I mean where they have them.

Dr. MOHLER. Yes, sir.

The CHAIRMAN. Take up your next project, contagious mammitis; then the next is investigation of the birth of immature and hairless pigs and other animals and of goiter in kids and lambs. Those are two small projects.

Dr. MOHLER. This contagious mammitis is a disease affecting the udder of cows and it is very serious. When it gets into a herd it spreads very rapidly by means of the milk hands going from diseased to [illegible] cattle. This project is for the purpose of producing a

vaccine for the disease, and we estimate that it will entail an expense of $300. The work is being done now, but it has not been completed.

Mr. WILSON. Do you find much of it?

Dr. MOHLER. Yes, sir.

Mr. WILSON. Why do you ask such a small appropriation?

Dr. MOHLER. Because the cause of the disease has been discovered and the only thing to do is to work on a vaccine treatment. The expense is small, because the principle underlying all these vaccines is the same. There is merely a difference in the technique of obtaining your culture and in the method of producing your vaccine.

Mr. MCLAUGHLIN. How long has this disease been known?

Dr. MOHLER. Probably seven or eight years.

Mr. MCLAUGHLIN. Where is it found to be most prevalent?

Dr. MOHLER. In the dairying sections of the East. The Annapolis herd was very seriously involved this last year and suffered a loss of three or four of their best cows as the result of "caked bag." The udders were ruined and these animals failed to give any more milk.

Mr. WILSON. Is the "caked bag" a sign of the disease?

Dr. MOHLER. Yes, sir; one sign of it. There is also another form of caked bag which the cow can have (a simple mammitis), occu ring right after calf birth from congestion, exposure, overfeeding, injuries, and from other causes; but that is not the contagious form referred to in this item.

Mr. WILSON. Then a cow may have caked bag and may not be affected with this disease?

Dr. MOHLER. Yes, sir.

The CHAIRMAN. Take up your next line of work.

Dr. MOHLER. This next project is directly connected with the cause of abortion of hogs and sheep; and what I said before applies to this investigation.

The CHAIRMAN. All right; the next is the investigation of swamp fever.

Dr. MOHLER. The investigation of swamp fever has been conducted for the last five or six years in Minnesota, in cooperation with the Minnesota Experiment Station and the Minnesota Live Stock Sanitary Board. The work that is being done now is to discover the method of transmission. It has been suspected that stable flies carry the disease from infected animal to healthy animal, and we have been cooperating with the entomologist of the Minnesota Experiment Station to study the character of flies that occur in that section. This disease is also found in Montana, Wyoming, and the Dakotas, and recently we have found some cases in Virginia.

The CHAIRMAN. How does it affect the animals?

Dr. MOHLER. It affects them a great deal like the takosis in goats. It is a wasting disease. They get very thin and anemic, with sudden rises of temperature. The temperature goes up at irregular intervals, like a relapsing fever in man.

Mr. STEELE. Do you communicate with Canada at all on that line?

Dr. MOHLER. Yes; Canada has a great deal of it. No doubt we got it from Canada.

The CHAIRMAN. Take up your next line.

Dr. MOHLER. The next is hemorrhagic septicemia investigations, on which it is proposed to spend $100. That is for the manufacture

of the vaccine, which has already been discovered and has been found very successful. We worked first on the buffalo, which were dying in Yellowstone Park of this disease, and perfected this vaccine. We stopped this disease among the buffalo, and since that time all we do is to make the vaccine for distribution to the various States where the disease is prevalent. The expenditure proposed is very small, as this is a completed line of investigation: the vaccine has been found.

Different commercial houses have now taken it up, following the methods suggested by the bureau, and these biological firms are putting it out on the market. We are merely supplying it to States like Iowa and Virginia, where requests have been made for the vaccine for their use.

Mr. McLAUGHLIN. Has this vaccine as made and sold commercially been found satisfactory?

Dr. MOHLER. Yes, sir.

Mr. McLAUGHLIN. That has not always been the case with some others, however?

Dr. MOHLER. Not all, no, sir; but this vaccine has been found very satisfactory thus far.

Mr. HELGESEN. I think if you would get out a bulletin describing these somewhat unusual diseases and suggesting what to do if a man happens to get them in his herd, that it would be a good thing.

Dr. MOHLER. The "Cow Book" and the "Horse Book" include most of these diseases I am referring to now.

Mr. HELGESEN. But those books are very hard to get.

Mr. HAWLEY. Anyhow, we should get new editions of those books.

Dr. MOHLER. I believe that is now before Congress.

Mr. OVERMYER. A resolution to that effect is in the Senate now.

Mr. HELGESEN. Do you not think a little pamphlet describing these diseases of cows and horses would be very valuable?

Dr. MOHLER. We have little pamphlets now covering these individual diseases, but they are also covered in the "Cow Book" and the "Horse Book."

Mr. McLAUGHLIN. Those books are about the same now as they were years ago, are they not?

Dr. MOHLER. No; they have been brought up to date in each different edition, and if a new edition is decided upon now it will be again brought up to date. These new vaccines will then be included in it, just as was done in previous editions.

The CHAIRMAN. I understand the Senate has passed a resolution in the last two or three days for reprinting the horse and cattle books.

Mr. McLAUGHLIN. Then, if it is reprinted, it will be brought up to date?

Dr. MOHLER. If it is reprinted it will be brought up to date; that has always been done heretofore.

Mr. HELGESEN. But, Mr. Chairman, 50,000 of those books would not amount to anything in the United States. It seems to me if we could get a small bulletin that would take up the most destructive of these diseases, issue them in greater numbers, and send them out to the stockmen of the country, that would be a wise precaution.

The CHAIRMAN. Of course, you understand, Mr. Helgesen, that that is a matter that goes to the Committee on Printing.

Mr. HELGESEN. But it will not go there unless a suggestion is made to them by some authority.

The CHAIRMAN. All right, Dr. Mohler; proceed with your next.

Dr. MOHLER. The investigation of Malta fever is practically completed also. The work resulted in the finding of a method of diagnosing and establishing the frequency of this disease, which existed in the goats of New Mexico and Texas, and which is transmissible to man from drinking the milk of infected goats. This expenditure of $200 was to apply a method of diagnosis, which is similar to the Wasserman reaction, and then to inject a vaccine for immunization purposes.

Mr. HAWLEY. Is that a dangerous disease?

Dr. MOHLER. It is something like typhoid fever, but the mortality is only about 2 per cent; it is not so serious as typhoid fever.

The CHAIRMAN. Is this the same as the Mediterranean fever?

Dr. MOHLER. Yes, sir; and in Texas it is also called "goat fever." It was popularly supposed that the association of people with goats exposed them to the disease and they contracted it. This has now been confirmed by scientific studies.

The CHAIRMAN. All right; take up your next.

Dr. MOHLER. Diagnosis of and immunization against anthrax. This is a highly fatal infectious disease of cattle, horses, sheep, and pigs and is easily transmissible to man. The work referred to here is the preparation of a serum which is obtained from horses that are prepared first by injecting them with the protective vaccine and then getting them so immune that they will resist a very large dose of the germs of anthrax. After the horse has withstood this method of preparation, his serum is of very high potency, the same as a hog treated with hog-cholera vaccine and virus produces a very potent serum for hog cholera. This is the same principle exactly.

The CHAIRMAN. How does the disease affect animals?

Dr. MOHLER. It is a form of blood poisoning. Infection is carried by means of the alimentary tract, or through respiration, or by the bite of a fly; and after the germ gets into the tissues it spreads to all the organs, like in blood poisoning. Human beings are usually infected by coming in contact with diseased animals; or employees in tanneries working on hides of animals that died of this disease sometimes become infected.

Mr. RUBEY. In all these investigations, you investigate to determine whether the disease will affect man and how it is transmissible to man, do you not?

Dr. MOHLER. Yes, sir; that is one purpose; and the serum for anthrax in cattle is also very satisfactory in the treatment of people having the disease.

Mr. STEELE. Is it true that anthrax can be carried in leather for 10 or 15 years—in harness, for instance? You will remember that about seven years ago there was an outbreak of it in South Dakota?

Dr. MOHLER. Yes, sir; I remember.

Mr. STEELE. You had five or six of your men there. I happened to be one of the men who lost a lot of cattle at that point. You made a very elaborate survey, both of those who did not vaccinate and of those who did; and the percentage of loss was greater among those who vaccinated than among those who did not.

Dr. MOHLER. A commercial house sent the vaccine material there.

Mr. STEELE. As I remember it, you found that there was a larger percentage of deaths among those who did vaccinate than among those who did not. Do you remember that particular case?

Dr. MOHLER. Yes, sir; that was one of the kind of cases to which Mr. McLaughlin just referred. That occurred a number of years ago, before the biological products act was enacted by Congress; and it was found that some of this commercial vaccine really produced the disease. One of the firms was sued, and I believe damages were obtained.

Mr. STEELE. Yes; we had one man who lost about $4,000.

Dr. MOHLER. That is why this work is being conducted—because the commercial vaccine has been found very unsatisfactory. We have been working with a spore vaccine, combined with a serum, to protect the animals in these infected pastures.

Mr. STEELE. Yes; I think your instructions to me and all our neighbors were to plow up these pastures, and we did so.

Dr. MOHLER. Yes. We have just had an outbreak in Saratoga County, N. Y. The disease remained quiescent there for six years and then suddenly broke out. We brought some of the hay from there to Washington and found that water used in washing that hay contained the germs of anthrax. The guinea pigs that we used in testing the hay died of this disease. The waters of one of the streams there were polluted with these germs. Cornell University reported to us that they had examined the water in that section and had found the same infection as was found in the hay. It is, therefore, very important that some form of vaccine be used, so as to encourage the raising of cattle in such an infected locality.

Mr. STEELE. The people were instructed that on those wet bottoms this anthrax germ would come out of the soil and get up on the forage.

Dr. MOHLER. Yes; that is true.

Mr. STEELE. And in that way they would get the disease.

Dr. MOHLER. The spore of anthrax is one of the most resistant forms of bacterial life; it will resist more heat and more chemicals than any other form of bacterial life that is known. That is the reason why it persists for so many years in the soil without any apparent decrease in its virulence.

The CHAIRMAN. Take up your next item, please.

Dr. MOHLER. The next is the investigation of glanders, with a proposed expenditure of $400. This work is conducted principally in cooperation with the State officials, in the same way that the dourine work is done. The sample of blood is sent to Washington, the test is applied, and then we telegraph or write to the State officials, telling them that the disease has or has not been found.

The next item is the investigation of dry immune serums. The idea of this project is to perfect some method of handling the various serums, like anthrax serum, so that we can send them out in a dry form, like the blackleg vaccine, rather than in a liquid form, the latter form being more susceptible of contamination after it leaves the Washington laboratory. That work has not been completed.

The next is the investigation of avian tuberculosis, avian diphtheria, bird pox, fowl cholera, white diarrhea of fowls, and canker of pigeons, with a proposed expenditure of $900. This work is purely research work, along the lines of infectious diseases of poultry.

CHAIRMAN. Is this the only work done by the department in
idy of the diseases of poultry?
MOHLER. This is the principal work being done by the depart-
with diseases of poultry. The Animal Husbandry Division has
l projects on blackhead in turkeys and several other diseases
they are working on now, with the object of getting a survey
prevalence of these diseases throughout the country.
CHAIRMAN. I was surprised, in looking through the Secretary's
the other day, at the heavy money loss due to diseases of
y, and I was wondering whether this matter had been pursued
orously as it ought to be.
MOHLER. The great trouble is that, after you have studied a
e of poultry and found a cure, the cure is frequently more ex-
e than the owner will feel justified in adopting. We have
a treatment for this white diarrhea of fowls, for instance, but
of the poultry raisers would prefer to kill the fowls than to buy
eatment and go to the trouble of applying the treatment to
dividual diseased birds.
CHAIRMAN. In my experience as a poultry raiser in a small way
ne, I found, in looking up your treatments, that what you say is
itely true—that they can not be put into effect on the farm
mically, but apply only to big poultry ranches. I was thinking,
ie method can be found for the control of these diseases that
be applied by the average farmer who has a few hundred
ns, turkeys, guineas, or ducks, that it would be very valuable
e country.
MOHLER. That is the reason that this expenditure is limited to
because the work now being done is along the lines of pre-
n, the treatment being applied in the drinking water or in the
so that all the birds will get the medicinal treatment at one
It is a somewhat similar problem to the treatment of ranch
, on account of the difficulty of handling these birds.
ANDERSON. There is a large number of chickens out at the
ille farm; what do you do with them?
MOHLER. That is another side of the chicken work. The ex-
nts conducted there are not on diseases but on breeding,
g, and egg production and work of that sort along the animal-
ndry line.
CHAIRMAN. Under Dr. Rommel?
MOHLER. Yes, sir.
HELGESEN. Where a man has poultry that is diseased and it
en in a run or a yard, is there not danger that, unless he takes
ll out and disinfects the place, they will all die?
MOHLER. Yes, sir; unless he disinfects his chicken house, coops,
ard, there is that danger.
HELGESEN. How about the cost of the disinfectant? Is that

MOHLER. No; it is not great. Our bulletins on poultry diseases
all of those preventive and disinfection measures.
MCLAUGHLIN. Do they cover all those matters you are speak-
?
MOHLER. Yes, sir; except this one disease, chicken pox. We
been working with a vaccine for this disease, and it has been

found to protect very well. That is new, and the results have been incorporated in a publication which is on the press.

The next item is also a poultry subject and relates to blackhead in turkeys.

The CHAIRMAN. I think you have completed that, too; the expenditure is given as $500.

Dr. MOHLER. Yes; as far as the work relates to the cause of the disease, it has been completed; but there have been no definite results so far as the treatment or prevention of blackhead in turkeys is concerned.

Mr. MCLAUGHLIN. You were speaking of this vaccine and how it is made. I would like to know what your method of giving publicity to your discoveries in vaccines is, and the way of making it. Do you publish a formula, so that the commercial houses get hold of it and make it after your formula; or how do they start to work manufacturing it?

Dr. MOHLER. Take, for instance, this anthrax serum. The results obtained by the bureau were first given publicity in an address at Oakland, Cal., where there were a number of these commercial firms represented. They took the original copy and had duplicate copies made by the public stenographer in the hotel and before the bulletin was published by the Department of Agriculture some of them had the serum on the market. This particular publication on anthrax serum will be out in a few days, page proof having just been sent to the bureau from the Government Printing Office, and some of the commercial houses are manufacturing this serum now.

Mr. MCLAUGHLIN. Your practice is always to give your formulas to the public, is it not?

Dr. MOHLER. Yes, sir; full information, so that they can duplicate the work in every respect.

The next is the investigation of Johne's disease, or bacillary enteritis, with special reference to methods of diagnosis. This is a disease of cattle which has just started to appear in this country. It is a very fatal chronic disease, and was, no doubt, imported from European countries, where it exists to a greater extent than in this country. The difficulty with the disease is that it is impossible to diagnose it until it gets into the last stages of infection, so that expenditure of $300 is for the purpose of finding some diagnostic agent that will determine the presence of this disease in the earlier stage, in the same way that tuberculin does with tuberculosis.

Mr. MCLAUGHLIN. It looks almost as if you ought to have more authority in the matter of inspecting cattle brought in from foreign countries. Evidently a lot of these diseases are brought in either without your knowledge or because your authority does not permit you to exclude them.

Dr. MOHLER. The principal reason is that the scientific knowledge is not broad enough to pick out these diseases with any present method. That is the reason that three or four years ago dourine could come into this country from France in the latent stage. There was absolutley no method of determining its presence or absence. Now, with this new method of testing, three days after the animal contracts the disease it will be detected by means of the blood test; but there is no such method now known that will determine the presence of this Johne's disease.

Mr. McLAUGHLIN. In regard to the dourine, if horses are imported om a country where it is known that this disease exists, are they lmitted if they show no outward signs of the disease?

Dr. MOHLER. We make blood tests, not only of horses but of mels and other menagerie animals that are coming from countries here there is a possibility that dourine exists.

Mr. McLAUGHLIN. Do you mean that you make a test of all horses efore you permit them to come to this country?

Dr. MOHLER. No, not all horses, because we get horses from Engnd and other countries where dourine does not exist; but, for stance, in the case of camels coming from Germany or from Africa, e bleed all those camels at the tip of the ear, and the blood samples re sent to Washington for test. Monkeys are treated in the same ay. We are now making a test of 75 monkeys brought from abroad; heir blood is tested in the same manner.

Mr. HAWLEY. Do they have dourine?

Dr. MOHLER. They do not have dourine but another disease caused y a similar organism.

Mr. HAWLEY. Is Johne's disease communicable to man?

Dr. MOHLER. No, sir.

Mr. DOOLITTLE. Where does this disease come from?

Dr. MOHLER. It was first discovered in Vienna, Austria, by Professor Johne.

Mr. DOOLITTLE. What is it?

Dr. MOHLER. It is an infectious form of enteritis, causing a gradual wasting away, with a profuse chronic diarrhea. The membranes of the intestines are very swollen and corrugated, so that the walls become three or four times thicker than normal. The animal has this profuse diarrhea, with more or less hemorrhage, and there is a gradual weakening and emaciation, resulting in death.

Mr. HAWLEY. Is this disease that monkeys have communicable to other animals?

Dr. MOHLER. Yes, sir. This test for dourine is a group test for all trypanosoma. Any disease caused by trypanosoma, like sleeping ickness, surra, nagana, or mal de caderas of South America, will eact to this blood test. All trypanosoma diseases react alike when ou make this test; so we do not know whether the monkeys which eact have surra or the sleeping sickness. It is important, however, o have them killed and disposed of if the blood reacts to the trypanosoma test, rather than let them come in, because we know an nimal will not react without having trypanosoma in the blood. o we treat this as a group infection and attribute it to any animals at react to this test.

Mr. McLAUGHLIN. There are so many monkeys in this country that any people would not think it any great loss if they were all killed; it you think that disease is communicated from monkeys to some nimals that are of value; is that true?

Dr. MOHLER. Yes, sir.

Mr. McLAUGHLIN. To what extent?

Dr. MOHLER. That we do not know; we have not worked on it to sufficient extent. Some of our monkeys come from various portions the tropics, where we do not know whether trypanosoma diseases ist or not; so we make the tests just the same. The Rockefeller stitute uses many monkeys in working on infantile paralysis, and

The next is investigation of trichinosis and measles, and ot zoological investigations relating to meat inspection. The w co-ordinated under this project consists of experiments to find effects of high and low temperatures in the treatment of tri chin pork, for the purpose of making pork safe for human food when consumed in an uncooked condition. These tests were conduc by the Zoological Division, and the results are incorporated in amendment to the meat-inspection regulations. Dr. Ransom fo that by subjecting the pork to certain high or very low temperatu the parasite known as trichina will die: and therefore all p products which are consumed customarily in a raw condition n go through a certain process of chilling, or else be heated to a cer point, before they can be used in any of these various products, green sausage, Italian hams, etc.

Mr. McLAUGHLIN. When it is consumed without being cooked what temperature is it brought?

Dr. MOHLER. It must be heated to at least 137 degrees or exp for 20 days to 5 degrees above zero, by refrigeration.

The CHAIRMAN. All right: take up your next.

Dr. MOHLER. The next is the index catalogue and collectio parasites. This takes up the time of one scientist entirely for k ing up the catalogue of the bureau regarding these various para diseases.

The next line is the investigation of roundworms of sheep, w is being conducted at a farm at Vienna, Va., and is especially for purpose of studying the life history of stomach worms of sh which are so troublesome and take so much from the profit of sh raising.

Mr. STEELE. On that point, take our State, Iowa, for insta It is often unprofitable for us, we find, to buy feed sheep from far

in Iowa on account of this worm that exists. Now, in our range sheep we do not find that so much, is that true?

Dr. MOHLER. That is true.

Mr. HAUGEN. What remedy have you to suggest for the worm?

Dr. MOHLER. This work has been in existence only for a year and the results are not determined.

Mr. HAUGEN. This is a new project.

Dr. MOHLER. Yes; we have just rented a farm at Vienna, Va., for the purpose of studying the life history of these parasites and to see what point in their life history is the most vulnerable for treatment. It also combines investigations of different lines of treatment.

Mr. STEELE. The worm does not kill the sheep, does it?

Dr. MOHLER. No.

Mr. STEELE. It just keeps him from fattening?

Dr. MOHLER. I have seen lambs 4 or 5 months old with 10 or 12 different parasites, such as stomach worms, tapeworms, liver flukes, and lungworms. In a case like that there is a high death rate, among the young lambs particularly; but, as a rule, the older sheep just become emaciated and do not thrive.

The CHAIRMAN. How large a farm is that at Vienna?

Dr. MOHLER. About a quarter section—160 acres.

The CHAIRMAN. Is that the farm that was proposed to be bought by the Government some years ago?

Dr. MELVIN. I think we discussed the purchase of this farm for this purpose about two years ago.

The CHAIRMAN. That was what I had in mind. You concluded to rent it, did you?

Dr. MELVIN. Yes, sir; it is being rented.

The CHAIRMAN. About what rent do you pay?

Dr. MELVIN. Fifty-five dollars a month, which includes a house and barn. This is at the rate of about 6 per cent on the value of the property.

Mr. ANDERSON. What is the property worth?

The CHAIRMAN. About $70 an acre, or $11,000 in all.

Mr. HAUGEN. Do you know how the rent paid by the Government out there compares with the rent paid by others?

Dr. MELVIN. It is about the same as for similar farms in that vicinity.

Mr. HAUGEN. Six per cent is a pretty good rent. I wish our farmers could get 6 per cent.

The CHAIRMAN. All right. Suppose you make a brief statement as to your next project, Dr. Mohler.

Dr. MOHLER. An investigation of parasites of hogs. This is very similar to the investigation of the roundworms of sheep. The work is conducted at the Bethesda experiment station and is for the purpose of finding a successful method of treating the intestinal roundworms.

Mr. HAWLEY. Is that a new project?

Dr. MOHLER. Yes, sir.

Mr. STEELE. It is not a new disease?

Dr. MOHLER. No, sir.

Mr. ANDERSON. Have you any sheep at Bethesda now?

Dr. MOHLER. Yes.

Mr. ANDERSON. Where do you keep them?

Dr. MOHLER. We keep them on the south side of the farm. We have not as many now as we had when these parasitic investigations (now transferred to Vienna) were being conducted there.

The next item is the investigation of parasitic protozoa. That is a project under the Zoological division and calls for an expenditure of $2,000. This is used principally for the salary of a protozoologist, who is working on these different forms of parasitic protozoa.

Mr. WILSON. What are protozoa?

Dr. MOHLER. Protozoa are little one-celled animal parasites. Texas fever is caused by a protozoan parasite covered by these investigations.

The next item is investigations of the use of dips in the treatment of cattle ticks, mange mites, and other external parasites.

Mr. STEELE. What further investigations are you making on the use of dips?—I supposed you had that all completed: at least, you eradicated the disease.

Dr. MOHLER. We have, for the mange mites; but what we are working on now are the lice of cattle and the six-legged tick of sheep. The sheep tick has never been affected by our dips which were so satisfactory in the treatment of sheep scab. In other words, this sheep tick is much more resistant than the sheep-scab mite; and the work we are doing now is to perfect a dip that will act in the same way against the sheep tick as it does against the sheep mite. This is a more difficult proposition, just as the cattle lice are much more difficult to kill than the cattle mites that produce mange.

Mr. HAUGEN. Do you suggest dipping for cattle lice?

Dr. MOHLER. Not necessarily.

Mr. HAUGEN. Is that practicable?

Dr. MOHLER. It would be if you were working on a range with very lousy cattle.

Mr. HAUGEN. Where there are a good many of them?

Dr. MOHLER. Yes. It would depend entirely on the economic view of the question whether it would be cheaper to put them through a dipping vat or hand dress them, but the former produces the best results.

The CHAIRMAN. Take up your next item.

Dr. MOHLER. The next is miscellaneous investigations of animal parasites and their control, which is very similar to the preceding project, except that the various parasites being worked on here are different.

The next item is investigation of animal tuberculosis, which is the work now being done at the experiment station by Dr. Schroeder. It consists of a number of different lines of work, such as the testing of tuberculin that is being put on the market by commercial firms, examining different excretions and secretions of tuberculous cattle, and studying the pathogenic properties of various forms of tubercle bacilli, such as those coming from man, hogs, and cattle.

Mr. WILSON. About a year ago there was a firm in Chicago that had some hog-cholera serum, and they had the approval of the department at Washington here, so I have been informed—that it was a good cure. They sold the serum and it was found to be not a cure, but caused more or less foot-and-mouth disease around there—in Illinois and in Indiana. Do you know anything about either one of those things? If you do, tell this committee about it, please.

Dr. MOHLER. That will come up under the item for hog cholera or under the foot-and-mouth disease paragraph, but if you want an answer here I will be glad to give ot.

Mr. WILSON. You will bring that up later, will you?

Dr. MOHLER. Yes, sir; in the next general heading in the estimate.

Mr. WILSON. I noticed this appropriation was for the investigation of these medicines, serums, and so forth, and I thought quite probably it would come in here.

Dr. MOHLER. That comes further along; we will discuss that when we take up hog cholera.

Mr. WILSON. Is there an appropriation to investigate these serums and medicines?

Dr. MOHLER. Yes, sir; later on.

The CHAIRMAN. Suppose you let that come later, Mr. Wilson, in its regular order.

Mr. WILSON. Yes.

Dr. MOHLER. The next is the expenses for the general maintenance of the Bethesda experiment station, which includes the keeping up of fences, the building of small houses, the expense of producing feed and forage for the experiment animals, and things of that character.

The CHAIRMAN. Take up your next.

Dr. MOHLER. The next item is breeding and feeding small experiment animals for disease research. At the experiment station at Bethesda we produce annually some three thousand guinea pigs and about half that number of rabbits for use in experimental investigations. This item covers the care and feeding and breeding of these smaller experiment animals.

The next is miscellaneous animal-disease investigations, which are conducted at the experiment station at Bethesda in cooperation with the different laboratories in Washington.

The CHAIRMAN. The cost is nominal, you say?

Dr. MOHLER. The cost is nominal. Just a few minor investigations are referred to the station by the laboratories in Washington, and the cost to the experiment station is no more than it would be if the laboratories were not in existence.

The CHAIRMAN. Mounting of pathological specimens for exhibition purposes; that is at a cost of $400.

Dr. MOHLER. That covers the collecting of pathological specimens found in meat inspection and preserving them in watch glasses for exhibitions and for educational purposes. Four hundred dollars is merely the cost of the glassware and the mounting materials.

The CHAIRMAN. The next is the poisonous-plant investigations, and for this you ask an increase, I think, of $5,000, do you not?

Dr. MOHELR. Yes, sir.

The CHAIRMAN. Tell us a little about that, please.

Dr. MOHLER. This plant-poisoning investigation work is done largely in cooperation with the Forest Service, and during the present year we have had a laboratory at Salina, Utah, alongside of the Forest Service building. The desire is to extend that line of work, and, instead of investigating one or two poisonous plants, we would like to take up the investigation of a number of poisonous plants at the same time.

There are several diseases in western Colorado affecting horses that we suppose are due to ragwort, and it is necessary, in order to determine the poisonous quality of this suspicious plant, to have horses on which to test it. This disease is not produced in cattle or sheep, and therefore it is necessary to have horses in this particular investigation.

Now, for the larkspur, death camas, snakeroot, and a great many of these other plants, it is necessary to have some other animals; because larkspur, for instance, will not affect at all certain species of animals like horses and sheep; and, as long as we have laboratories and men, they might as well make an investigation of a number of poisonous plants at one time rather than to confine themselves to one or two plants. To do so, of course, necessitates the buying of a large number of experimental animals.

The CHAIRMAN. Approximately, how many animals would you have, Doctor; a dozen or so?

Dr. MOHLER. Oh yes; a great many more than that. They usually try to get 25 or 30 animals for each plant.

Mr. STEELE. Are the animals destroyed in those experiments?

Dr. MOHLER. Sometimes they are.

The CHAIRMAN. What do you have to pay for those animals—$75 or $100?

Dr. MOHLER. Not more than that. We can get range horses for $50 to $75 that will be satisfactory. Cattle will cost from $25 to $40. The sheep will not cost more than $8 apiece.

The CHAIRMAN. Do the cattle and horses feed on the range, or do you have to buy the feed?

Dr. MOHLER. They are kept in a corral, and, of course, we have to purchase food and forage.

The CHAIRMAN. You are doing it rather cheaply, are you not, for $5,000? I suppose, however, a part of the $8,000 is used for that purpose?

Dr. MOHLER. Yes.

Mr. STEELE. You have found out what caused loco, have you, in horses west of the Missouri River?

Dr. MOHLER. Yes, sir.

Mr. STEELE. You have found the particular plant, have you not?

Dr. MOHLER. Yes, sir. That was the early work done under this same line of investigation when it was located in the Bureau of Plant Industry, but last July the work was transferred to the Bureau of Animal Industry.

Mr. WILSON. There is a cure for loco, is there not?

Dr. MOHLER. Yes.

Mr. STEELE. Have you discovered, after the hay is cut and put into a stack and it is then fed to the horses, whether it will transmit the disease to the horses, or is it only the green plant that does it?

Dr. MOHLER. Loco will also poison animals after it is cut. Now, you can not always reason by analogy. In the case of loco we know that the cut plant will do the same thing as the green plant; but in the case of the cornstalk disease, as soon as the cornstalk is cut the poisonous substance is eliminated and you can feed the cattle the same cornstalks with impunity, which, if left standing in the field, would produce death in some animals eating them.

The CHAIRMAN. There is one other thing about that I would like to ask you about, if that completes your statement in reference to poisonous plants. I notice in the book of estimates that you want $10,850 for the construction at Bethesda of four small stock barns, a hay-storage building, and an incinerator to dispose of the carcasses of experimental animals. Do you care to discuss that item?

Dr. MOHLER. This item is requested in order to provide funds for the building of new barns. You will recall the old barns there have been up for eighteen or twenty years—ever since the place has been owned by the Government—and they have served their purpose. They are very insanitary, and the idea is to replace them with four smaller barns in the place of those two very large barns that are so badly worn.

The CHAIRMAN. Can you use those barns for another year very well? I mean, could you get along for one year more with those barns without any serious inconvenience to the department's work?

Dr. MOHLER. That could not be done if we should have a serious outbreak of foot-and-mouth disease to take care of at Bethesda; and the principal reason for getting rid of the old barns is to put up new, sanitary, concrete barns, with our own men, who know how to erect these concrete buildings, in order to handle infectious diseases like the foot-and-mouth disease. During the past year we had so many different specimens of material to test that we were at times delayed in testing them because we did not have sufficient safe buildings in which to put the animals. Those old buildings can not be used to test out animals with such highly contagious diseases as the foot-and-mouth disease. So it would depend entirely on the use to which we would have to put those buildings during the next year.

The CHAIRMAN. I know your buildings out th re are old. They were old the last time I was there, and that was five or six years ago. But what I was wondering was whether you regarded this as an emergency proposition, or whether it could not wait a year or so.

Dr. MELVIN. We have been putting up for several years, Mr. Chairman, with these old barns, which are incapable of proper disinfection in case of the treatment of diseases of this sort. The barns we propose could be thoroughly disinfected without any danger of the disease remaining, and it is quite important, I think, that they be supplied, if possible.

The CHAIRMAN. I am sure the committee is in sympathy with the purpose of doing everything possible to give you as fine a laboratory out there as possible; but what I am trying to bring out is whether you do not think you could go ahead with this work with the present buildings, or whether you consider this as a real, genuine, emergency which ought to be taken up this year, in view of the state of the Treasury?

Dr. MOHLER. At the present time we are only using one-quarter of the largest barn, because the rest of the barn is absolutely unsuitable for stabling diseased animals.

Dr. MELVIN. The incinerator is quite necessary, too, because we have been disposing of the animals principally by burying. In some cases we can cook the flesh and use it for feeding to smaller animals.

The CHAIRMAN. About what would this incinerator cost?

Mr. ANDERSON. It is given on page 51 of the Book of Estimates as $2,500.

The CHAIRMAN. Two thousand five hundred dollars for an incinerator?

Dr. MELVIN. Yes.

The CHAIRMAN. Are there any further questions on that point?

Mr. ANDERSON. I would like to ask a question or two. There is some question in my mind whether, in view of the location of that station out there and the probability of that section building up with residences, it is not desirable to spend very much money in the construction of new buildings. In the first place, as I understand it, you have not even a road leading up to your place.

Dr. MELVIN. We have a right of way to the premises. I think by deed, but it is true that there is not a public road.

Mr. ANDERSON. As I understand it, the area used by the station out there has been gradually lessened; you are now renting a portion of the land under lease, and it is a matter of probably only a short time when you will not be able to rent that land. Taking it all together, there is a great deal of question in my mind whether it is going to be an economical proposition to construct permanent buildings in that location.

Mr. WILSON. How many acres do you own?

Dr. MELVIN. We have a tract of something over 50 acres.

Mr. WILSON. Fifty acres?

Dr. MELVIN. Yes. Then we have been able to rent more or less land in adjoining tracts, for the purpose of raising feed for the experimental animals that we use. It is true, as Mr. Anderson says, that that section is building up very rapidly as a residential section—as a suburban section. But there is already a big investment by the Government in that property; there is the laboratory there, and a great deal of money has been spent, which is not visible, in the way of water pipe, roads upon the grounds, fencing, and so on. So it would make it a very expensive proposition to obtain other property and put this same equipment on it. Just how long we can stay there, I do not know and I do not know that any one knows. But if we were to stay there, say, 10 years longer, which in all probability we will be able to do, I think it will be worth this investment that we are now asking for.

Mr. ANDERSON. I am perfectly willing to admit that you need the buildings. There is no question in my mind, and I do not think there will be in the mind of any man who inspects those buildings, that they are not suitable for carrying on any experimental work where sanitation or disinfection is necessary. The only question in my mind is whether it is desirable, in view of the situation, to make a further permanent investment out there.

Dr. MELVIN. I believe we are fairly sure of being able to stay there at least 10 years longer without very serious complaint from the people in the neighborhood, and if we do stay there that long I think it will pay to put up these buildings, even for that length of time.

Mr. HELGESEN. How about this station you have 12 miles out?

Dr. MELVIN. That is of a different character. That is devoted entirely to experiments in dairying and animal husbandry. I do not think it would be wise to have this station connected with that.

Mr. CANDLER. How much land does the Government own at Beltsville, Doctor?

Dr. MELVIN. It has about 450 or 500 acres at Beltsville.
Mr. CANDLER. You have plenty of room out there, then?
Dr. MELVIN. Yes.
Mr. ANDERSON. That is quite a farm.
Dr. MELVIN. It is quite a farm; yes.
Mr. ANDERSON. That is a dairy and sheep farm?
Dr. MELVIN. Yes, sir.
The CHAIRMAN. Are there any further questions on that item?
Mr. ANDERSON. Do you mean either the Beltsville or the Bethesda item?
The CHAIRMAN. Yes.
Mr. ANDERSON. I would like to ask a question about Beltsville.
The CHAIRMAN. Dr. Rommel spoke of Beltsville, you remember, the other day.
Mr. ANDERSON. You estimate at the Beltsville farm, I think, for $6,000 for the construction of a sheep barn. That seems to me to be a pretty large expenditure for a barn such as I would imagine would be necessary for a sheep barn. Is it to be a concrete structure?
Dr. MELVIN. Partly. The barn that was burned down, I think, cost about this same amount, and we were figuring on an equal amount for the new barn. It is intended to be a permanent barn, and a building of good construction.
Mr. ANDERSON. I have an impression that out in our country we are able to build a pretty good-sized barn for around a couple of thousand dollars, and I can not understand why the construction of an ordinary barn down in this country should cost six, eight, ten, or twelve thousand dollars.
Dr. MELVIN. We expect this to be a great deal better than an ordinary farm barn. The inside fittings and the arrangement are very different. Many of these stalls for the sheep will be single paddocks, and the internal arrangement will be much more expensive than an ordinary farm barn would be.
The CHAIRMAN. You conduct your experiments in feeding and the like out there, and therefore you practically have to have a stall for each sheep, do you not?
Dr. MELVIN. For the feeding and breeding; yes, sir.
The CHAIRMAN. And things of that kind?
Dr. MELVIN. Yes.
Mr. ANDERSON. I think I asked you if this would be a concrete structure.
Dr. MELVIN. I do not think it will be entirely concrete. It will have a concrete foundation. I think they were figuring on fireproofing it a great deal more than the other building was, especially the floors, so as to prevent, in case of fire, the ready spread of the fire to other floors.
Mr. ANDERSON. I notice most of the buildings you have erected at the dairy farm are concrete buildings. Of course concrete construction, I take it, is more expensive than the other kinds, and I was wondering what your idea was in using concrete construction—permanency?
Dr. MELVIN. It was both for the purpose of adaptability and of determining which construction would eventually be the best as a general proposition for farm buildings.

Mr. HELGESEN. What is the comparative cost of concrete and frame construction?

Dr. MELVIN. We have not exactly similar buildings to compare. As Mr. Anderson has indicated, I think the concrete construction is the more expensive. It is not prohibitive, however.

Mr. ANDERSON. There is no question of fire protection involved, is there?

Dr. MELVIN. Yes; there would be. Take a fire from an outside source; of course it could be controlled a great deal better, so far as its spread to other buildings is concerned, where concrete was used, with fireproofed shingles, than where it is all frame construction. Of course, if a fire should occur within the building, it would all burn out just the same.

Mr. ANDERSON. Just one other question: You have, as I recall it, three silos out there now and you are estimating for two more.

Dr. MELVIN. Two silos and a silo shed.

Mr. ANDERSON. What do you want with five silos there? You can not raise enough stuff on that little farm out there to fill five silos, can you?

Dr. MELVIN. I would like you to see some of the corn we have raised out there. I do not know whether it is on the dairy farm or the animal husbandry farm where these silos are asked for. Those stations have, as a matter of fact, developed into very productive farms. They were very much depleted and run down when they were acquired by the department, but with the use of a great deal of fertilizer they are now in fair shape, and at least the bulk of the fields are very productive.

Mr. ANDERSON. Those silos are to be used in connection with the dairy farm?

Dr. MELVIN. I understand so.

Mr. ANDERSON. You have five silos in connection with the dairy farm?

Dr. MELVIN. There will be; there are three there now.

Mr. HAUGEN. And how many cows are connected with them; or, rather, how much stock?

Dr. MELVIN. I should say perhaps 50 or 75 head altogether.

Mr. HAUGEN. Seventy-five head?

Dr. MELVIN. Yes.

Mr. HAUGEN. One silo ought to supply 75 head.

Dr. MELVIN. Well, it depends on the size. I do not know the comparative sizes of those.

Mr. HAUGEN. It would take quite a large silo.

Mr. HELGESEN. You were speaking of having bought that land in a depleted condition and having been able to bring it back to productiveness. Were you able to do that at an expense which would justify private individuals making a similar investment?

Dr. MELVIN. I can not speak with authority on that, but I think land that you can buy for $25 or $30 an acre can be brought back to a very good state of cultivation at a total expense, including the original cost, of say, $65 or $75 an acre, and you would probably have doubled the value of your land in bringing it back.

Mr. HELGESEN. You think it would bring a return, then, on that amount of money and be a profitable investment?

Dr. MELVIN. I think so; yes. But I think that any one buying one of those farms that are run down and worn out should have sufficient capital to start with.

Mr. HAUGEN. The increased production, however, has been brought about by the use of fertilizer?

Dr. MELVIN. Fertilizer, manure, lime, and bone.

The CHAIRMAN. Dr. Melvin, we are very much obliged to you for your interesting statement.

(Thereupon, at 12 o'clock noon, the committee took a recess until to-morrow, Saturday, January 15, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Wednesday, January 19, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. Dr. Melvin, we had concluded item 58 of your bureau, and we will take up this morning item 59, "For all necessary expenditures for the investigation, treatment, and eradication of hog cholera," etc. I presume this morning you would like to take up your hog-cholera work and tell what you propose to do the coming fiscal year. It is on page 43 of the estimates, gentlemen.

FURTHER STATEMENT OF DR. A. D. MELVIN, CHIEF OF THE BUREAU OF ANIMAL INDUSTRY.

Dr. MELVIN. As you know, we have been carrying on investigative work in reference to hog cholera, its treatment and eradication, under two plans.

One was where we selected a county and put two or three veterinarians in the county, getting what cooperation we could from the State, and made a complete canvass of the hog owners, with a view to the treatment of all infected herds and exposed herds and disinfecting the premises, with a view to determining whether the disease could be eradicated in those counties or reduced to a minimum.

The other plan was to have one man take up the work in States through the farmers' associations and county agents, and all forces of that sort, in actually treating the animals and making demonstrations in various sections of the State that he was working in with a view to educating, as far as possible, the hog owners as to what may be done in the way of treating the disease.

The third line of work under this appropriation was supervising as far as we could, the manufacture and distribution of antihog cholera serums and vaccines.

Now, we have in this estimate for the next year asked for $185,000. Of this $150,000 would be for supervising serum plants and the balance for investigative work in hog cholera. We felt that we had gone sufficiently far in these two lines of work to place before the committee the results of our two and a half years' work, and that the committee could then judge whether it was desirable to continue the work along those same lines or not. We feel that we need that amount of money, $150,000, for supervising the manufacture of antihog-cholera serum. The manufacture of those serums has increased tremendously in the United States, and the work on that account requires more men.

Mr. WILSON. Why is it that you have to supervise the manufacture of serum?

Dr. MELVIN. It is simply to protect the users of this material and provide a reliable article which will do the work.

Mr. OVERMYER. You explained before, Doctor, if I remember rightly, that, unless the serum is properly made and applied, it is worth less than if none at all were used.

Dr. MELVIN. Yes, sir; it is very much worse, because by using both the serum and virus, unless the serum is good and potent, you are setting up new centers of hog cholera all over the country. And if the serum is used alone, unless it is potent, it does not protect the hogs, and they die in spite of the treatment.

Mr. HAWLEY. How many plants are there which you have to inspect now?

Dr. MELVIN. There are about ninety.

Mr. WILSON. It seems as if there ought to be some penalty for those fellows putting out a bad medicine of any kind. It seems that they might be regulated without this great expenditure of $150,000.

Dr. MELVIN. You can not do it. Unless a close supervision of this serum is made and the different batches are tested to determine their potency, the result will be that instead of having a product which saves tremendous losses every year in the hog industry, there would be the same losses as before.

Mr. WILSON. Is there not some way by which you can penalize them for making this medicine which is not effective?

Dr. MELVIN. There are penalties for all sorts of crimes.

Mr. HELGESON. There is only one way to remedy it, and that is for the Government to make the serum, and I think any other system is absolutely wrong.

Mr. ANDERSON. How many men have you employed in this inspection work?

Dr. MELVIN. We have been adding different men, from time to time; there are now 56.

Mr. ANDERSON. A little more than half as many men as there are factories?

Dr. MELVIN. Yes. We find that in some places these plants are in groups where one man can look after two or three.

Mr. HOWELL. I should imagine that self-interest would compel those manufacturers to put out a good article, because it would be fatal to them for you to publish the fact that they were putting out a bad article.

Dr. MELVIN. One would think so; but, as a matter of fact, it does not work out that way. After this act was passed, giving the department authority to look after those establishments, it was found that the serum was made by all sorts of men, some of whom had absolutely no qualifications whatever, scientific or otherwise, for making a product of this sort. In spite of all this, however, they could sell their product which was worse than nothing.

Mr. ANDERSON. What is your method of correcting those evils—to publish your findings?

Dr. MELVIN. No, actual supervision. We require, in the first place, that the man shall provide proper equipment in the way of laboratories, etc., so that mechanically all the requirements necessary to make a good product are there. Then we have regulations regarding

the method that he shall use in testing the serum and the vir
regarding the localities from which hogs may be bought—regu
of that sort. And, as closely as we can, our men see that those
are followed by the manufacturer.

Mr. HELGESEN. What objection do you have, if any, to th
ernment manufacturing the serum themselves?

Dr. MELVIN. I do not know that I have any objection exce
it will require a tremendous outlay of money on the part of th
ernment, because there is an immense amount of this material

Mr. HELGESEN. That is true; but, in the first place, we are e
ing an immense amount of money now with very bad results t
of people, and the losses last year or the year before in the S
Iowa alone, I understand, were $30,000,000. Anyway, it r
high as $30,000,000 in a single State. When dealing with s
important proposition, we ought not to hesitate on a thing
kind. I do not believe we will ever get a good, reliable serum
the Government manufactures it itself.

Mr. ANDERSON. Do different concerns manufacture di
serums?

Dr. MELVIN. Some of them do, but not different hog-
serums. They make different serums and vaccines for
diseases. Some make quite a large variety of serums, antitoxi
products of that sort. As a rule, those hog-cholera serum m
engaged in that work alone.

Mr. ANDERSON. Has the department ever made any estimat
the cost of erecting a plant or plants sufficiently large to take
the entire United States output of hog-cholera serum?

Dr. MELVIN. No; we never have done it in that way. I p
it could be arrived at pretty definitely by taking some typica
like a plant they have provided in the State of Ohio. That is
typical, either, but it could be used as an illustration. Take
a basis for our own and divide the total amount of serum pr
in the United States by what they produce. That would gi
ratio of expense.

Mr. ANDERSON. How many States are there now having Sta
cholera serum plants? Can you state?

Dr. MELVIN. About 21.

The CHAIRMAN. Twenty-one, the secretary's report says.

Mr. ANDERSON. And in all of those States, do the State
supply and manufacture a sufficient amount of serum to tak
of the entire requirements of the State?

Dr. MELVIN. No, sir; not by a very large percentage.

Mr. ANDERSON. The State production, then, in most insta
merely a fraction of the entire amount used in the State?

Dr. MELVIN. Yes, sir.

Mr. HELGESEN. How long will this serum keep after it is
factured?

Dr. MELVIN. It will keep for several months, at least, under
cool conditions.

Mr. HELGESEN. But it will not keep from one year to anothe

Dr. MELVIN. It would under proper refrigeration.

Mr. HELGESEN. The trouble with State manufacture is,
understand the ravages of hog cholera, that it would be diffi
different years to have enough manufactured to meet the n

ıe State supply. When the ravages of the disease are very severe, ıey would have to manufacture a large amount; but the next year, the disease was light, they would have a lot of that stuff on their ands.

Now, if the Federal Government should manufacture it, they ould avoid that, because they would always have enough on hand) take care of the ravages as they appear in the country at large, nd it would save a vast amount of money to the people by having manufactured in a central plant instead of having it manufactured ı plants scattered all over the country. So it would be better for he Government to manufacture it instead of private concerns. I hink the present system is wasteful.

Dr. MELVIN. I do not think it would be possible to have one central lant.

Mr. HELGESEN. Not one, but probably half a dozen, to manufacure it for the whole country is a better proposition than for each tate to manufacture it separately.

The CHAIRMAN. Have you figures, Dr. Melvin, of how much it vould take to inaugurate a plan for Government ownership and nanufacture of serums for the use of the entire country?

Dr. MELVIN. I would like to have Dr. Dorset give the figures as to the total amount of production of serum in the United States.

Dr. DORSET. Mr. Chairman, the States, we estimate, produce from fifty to sixty million cubic centimeters per year. We have no definite figures for this last year.

The CHAIRMAN. How much is a centimeter worth?

Dr. DORSET. A centimeter is produced at a cost of around one cent. It sells to the farmer probably on the average of one and a half cents.

Mr. HAWLEY. Is that a dose?

Dr. DORSET. No, sir; it takes from 20 to 30 cubic centimeters for a dose. The private plants licensed by the Federal Government (we have no figures from unlicensed plants) produced this last year ıpproximately 206,000,000 cubic centimeters of serum. In other vords, about four-fifths of the total produced in the United States ; produced at these commercial plants.

Mr. WILSON. That was produced by the commercial plants, did ou say?

Dr. DORSET. Yes, sir.

Mr. WILSON. And about 56,000,000.

Dr. DORSET. From fifty to sixty million is rather a rough estimate f the State production.

Mr. HAWLEY. And what proportion of the entire output of those ɔmmercial plants did you find was bad—that you condemned last ear?

Dr. DORSET. We condemned 4,272,564 cubic centimeters of the ɔtal. That would be about 2 per cent.

Mr. HAWLEY. On what account did you condemn it?

Dr. DORSET. It was found to be either worthless or contaminated.

Mr. WILLSON. Four million?

Dr. DORSET. Yes, a little over four million.

Mr. HAWLEY. And what proportion of the amount that you conemned was contaminated?

Dr. DORSET. It was all contaminated or worthless. That is, a sample of a batch was tested—a representative sample of the batch—and, if it was found to be contaminated or worthless, it was condemned.

Mr. HAWLEY. All of that four million was contaminated?

Dr. DORSET. Yes, sir; all of the four million was condemned.

Mr. HAWLEY. Was it all contaminated, or was some of it worthless or valueless?

Dr. DORSET. I am unable to say what proportion was contaminated and what proportion was worthless, but it was all condemned for one reason or the other.

Mr. HOWELL. How many establishments are found to be putting out this contaminated serum?

Dr. DORSET. That occurs or may occur at any establishment producing hog-cholera serum, because after the serum is manufactured and when it is finished the establishment puts it to test, and on test it may found to be worthless, though at the time of making the test they had no way of knowing that. So that may occur at any establishment, although very well run.

Mr. MCDERMOTT. Does the establishment get any compensation for this virus that is condemned?

Dr. DORSET. No.

Mr. HOWELL. In that case, then, if it can be determined that it is contaminated and it has been tested and condemned and then put on the market, that would be done wilfully and for the purpose of defrauding the purchasers?

Dr. DORSET. Either for that purpose or because of overconfidence on the part of the manufacturer in his product, and believing it must be all right and not taking the proper precautions to test it. Of course, the test of this serum in itself can not be absolutely perfect. The tests are made on animals, and any tests made on animals are always open to some objection.

Mr. HELGESEN. How many commercial plants are there unlicensed do you know?

Dr. DORSET. We have no definite census of those, but we think there are possibly 15 to 20, operating in the United States.

Mr. HELGESEN. Do you not think some provision ought to be made whereby no one could manufacture it except on license from the Government?

Dr. DORSET. If I may, I would like to answer that, Mr. Chairman, in this way: The Secretary of Agriculture, in his last report, has presented a plan and suggested a course which, in my opinion, is a good one and the most practicable and feasible of all.

The CHAIRMAN. At that point, I am going to ask the clerk of the committee to read into the record the suggestion of the Secretary of Agriculture on that proposition, which is very interesting to me.

(The extract from the annual report of the Secretary of Agriculture for 1915, read by the clerk, follows:)

Government test station.—As a substitute for Government ownership, the following plan merits careful consideration:

(1) Continue the inspection service as at present constituted under the act of 1913, maintaining a sufficient force of inspectors so that all important processes of licensed establishments may be carried out under the constant supervision of department employees; and require that all products after preparation be securely locked up by

employees of the department, whose duty it shall be to withdraw representative samples.

(2) Provide by law for—

(*a*) The establishment and maintenance of a "Government test station" for serum. The purpose of this station would be to receive official samples of all serum produced by licensed plants and to test them for purity and potency. Upon completion of the test the official in charge immediately would make known the results to the inspector at the plant from which the sample was derived, and the material, if found potent and pure, then would be released with proper markings or seals to show that it had been tested.

(*b*) The prohibition of the interstate shipment of any product a sample of which had not been tested and found pure and potent.

(*c*) The imposition of a tax upon all serum, samples of which have been tested, with adequate provision for the affixing of tax stamps and marks prior to sale or shipment.

The available methods for determining purity and potency are not scientifically exact. Tests, however, are a necessary and most important part of any system of control. They are now made by the commercial establishments themselves on animals procured by them and at all times under their care. It is impracticable for the Government to make them within privately owned and operated plants. Furthermore, so long as the plants conduct the tests, it is manifest that the Government can not select and know the complete history of the animals. In the preparation of the serum, the inspectors can see that the steps necessary to produce a good article are carried out. In this particular the inspection is adequate and effective. It appears, therefore, that the weak point at present is the inspection of the tests; and the department believes that these should be under Government control. At the same time, not being absolute, they should be supplemented. Supervision at the producing plants of the methods of preparation and handling should be continued.

It is probable that an adequate test station could be provided for about $50,000. If several were found to be desirable, a suitable appropriation for each would have to be made. The cost of maintaining a station capable of testing the entire output of commercial serum in the United States probably would not exceed $150,000 annually.

The suggestion is made that a tax sufficient to cover the cost of maintaining the station should be imposed. This tax should not operate to increase the cost of serum to the farmer, because manufacturers would be relieved of the expense of conducting their own tests. While the plan indicated contemplates control only of serum intended for shipment in interstate commerce, it is likely that the States would take similar action and apply similar rules to their own plants as well as to private establishments doing business wholly within the State. The plan probably would be effective and would require little additional expenditure of public funds.

Mr. HELGESEN. Now, right at the beginning of that suggestion, the Secretary mentioned the licensed plant—that this recommendation is for the licensed plant; but he did not include the unlicensed one, as I understand it.

The CHAIRMAN. I think the plan contemplates that all establishments shipping serum or virus into interstate commerce must hold a license.

Mr. WILSON. Is that the law?

Dr. MELVIN. Yes, sir; that is the law.

The CHAIRMAN. That is the law now. In addition to that, these serum and virus plants must be tested out before they can go into interstate commerce at all. That seems to be the plan suggested here.

Mr. HAUGEN. It is a fact that the Secretary has no authority or jurisdiction over plants engaged in intrastate commerce; so it is not possible for him to test all the serums that are manufactured. No such law could be passed.

Dr. MELVIN. No.

Mr. HAWLEY. What check have you on those unlicensed plants to see that their serum is not sold into interstate commerce?

Dr. MELVIN. It is made incumbent upon the carriers not to receive it for interstate shipment. I do not think that such business could be carried on to any extent until we would very quickly hear of it. These men who are operating under licenses would know of it very quickly and inform us.

Mr. HAWLEY. Have you encountered any attempts to ship from these unlicensed plants into interstate commerce in the last year or two?

Dr. MELVIN. I think there were one or two attempts, but that has not been done extensively. In those cases there were some little differences as to our authority to prosecute, as the serum was carried by persons across State lines and not shipped.

Mr. MCDERMOTT. Doesn't it stand to reason that even in the State the man buying the serum would want to get the Government's O. K. on it?

Dr. MELVIN. Practically all of those plants operating without licenses are very small affairs and do a restricted business.

Mr. MCDERMOTT. There are a lot of them in the stockyards in Chicago, and they would want the Government's O. K. on their product, so as to be a guaranty that it was all right.

Dr. MELVIN. They consider it such; yes, sir.

The CHAIRMAN. Let me ask you this question: You say there are about 90 establishments manufacturing these serums?

Dr. MELVIN. Eighty-six, I believe, is the exact figure.

The CHAIRMAN. Have you any idea as to what the value of those plants are—the cost of the establishment, and so on?

Dr. MELVIN. They vary a great deal in value, possibly from $15,000 or $20,000 up to the vicinity of $100,000. A few of them are very fine establishments. Most of them, I presume, taking into consideration their entire equipment—land value and all—would probably average from $25,000 to $40,000.

Mr. HELGESEN. Could not the same quantity of serum be manufactured with a less amount of capital and with a smaller overhead charge if it were produced in large plants, say, half a dozen in the country, than it could be produced in a lot of small plants scattered all around the country—over a hundred of them?

Dr. MELVIN. There would undoubtedly be some saving, but it would not be in proportion to the number of plants, as compared with one.

Mr. HELGESEN. Oh, no.

Dr. MELVIN. You must have a certain amount of overhead scientific control, which would be lessened, perhaps, if four or five of those plants were combined into one; but I do not see how it would be possible to combine all of them into one.

Mr. HELGESEN. Not into 1, but into 10, say.

Mr. HAUGEN. Doctor, my recollection is that two or three years ago you gave an estimate of the cost of a Government plant to take care of the situation. I believe you estimated $200,000, did you not?

Dr. MELVIN. That estimate did not have reference to a plant, Mr. Haugen, for the manufacture of serum for the whole United States. That figure was stated as the probable cost of replacing in a modern up-to-date way the plant that we are now operating at Ames.

Mr. HAUGEN. The plant you suggested at Ames was simply a small one; but here are a number of those plants now, you say, representing an investment of from $15,000 to $25,000. How much would be required to equip and construct a plant that would supply the country outside of those States that supply their own requirements?

Dr. MELVIN. To replace all these commercial plants?

Mr. HAUGEN. Not to replace all of the commercial plants, but to supply the demand for the serum outside of the States that have their own plants. We have a number of them. Ohio has one, and it supplies the people of Ohio with a considerable amount. The same is true of Iowa and a number of other States.

Dr. MELVIN. With regard to this plant in Ohio, I think the equipment itself, building, and everything would cost in the neighborhood of $100,000. I do not know just what proportion of the serum used in Ohio is furnished by this establishment, but I would not imagine that more than 25 per cent of the serum used is manufactured within the State. They probably are making as much serum as they can with their facilities.

Mr. OVERMYER. I know that to be the case to-day.

Mr. HAUGEN. Can you give us a rough estimate as to the amount of money required to construct and equip a plant?

Dr. MELVIN. It runs into pretty big figures, and I would rather hesitate to make an estimate; but I think it would be in the vicinity of two or three million dollars, at least.

Mr. HAUGEN. What capital is invested in these 86 plants? I take it you have some information on that.

Dr. MELVIN. That is a question of mathematics. I have not figured it up.

Mr. HAUGEN. When you speak of two or three million dollars, do you speak of the plant itself?

Dr. MELVIN. Yes, sir; the whole business.

Mr. HAUGEN. Two or three million dollars is probably two or three times the amount invested at the present time, according to your figures of $20,000 to $25,000, which I understood you to say was the average value of these plants.

Mr. MCLAUGHLIN. Some represent an investment up to $100,000.

Mr. HOWELL. $20,000 on the average would be about a million and three-quarters.

Dr. MELVIN. I think it would be more than that.

The CHAIRMAN. As I understood Dr. Melvin, he said the average value of those plants would be about $35,000—between $25,000 and $40,000.

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Taking an average of $35,000 each, and multiplying that by 90, I get $3,150,000.

Mr. HAUGEN. At $35,000?

The CHAIRMAN. Now, then, there are 21 States which have these plants, and I want to inquire whether the plants in those 21 States are included in those 90 you mentioned?

Dr. MELVIN. No, sir; they are not?

The CHAIRMAN. I assume that, on an average, the value of those plants would be $35,000, which would aggregate $735,000 for the State plants. That would make a total investment of $3,885,000

in the plants of which you have a record now. Is that about right, Dr. Dorset?

Dr. DORSET. I think Dr. Melvin gave that as an estimate. We have no definite knowledge of the cost of those commercial plants.

The CHAIRMAN. I appreciate that.

Dr. DORSET. But that probably is about right; something like that. I concur with Dr. Melvin's estimate entirely—that, if the Government puts up suitable plants, it would take several million dollars to do it.

Mr. HAUGEN. Several million dollars, Mr. Chairman, is indefinite. The committee ought to have definite figures and information. I take it that you could not estimate within a few thousand dollars, but you have been engaged in this work all of these years and you ought to be able to estimate within millions where you must have some knowledge as to amounts invested. If you fix it at $3,000,000, let us take $3,000,000 as the estimate. Do I understand you to say that it would take $3,000,000 to erect the plants in the United States, including equipment, construction, and all? I am not talking about operation.

Dr. MELVIN. I would like to consider that and put in the record——

Mr. HAUGEN. I would like to have it now, so that we can have something on which to base consideration as to the amount of money that it would cost the Government to construct these plants. Do I understand you to contend that it would take $3,000,000 to construct a suitable plant?

Dr. MELVIN. No; I only gave my figures as a rough estimate.

Mr. HAUGEN. Would you estimate it at $2,000,000, $3,000,000, or $5,000,000?

Dr. MELVIN. I think it would be nearer $3,000,000; but possibly it would go to $4,000,000.

Mr. HAUGEN. The estimate this year is $150,000 for the inspection of the plants?

Dr. MELVIN. Yes, sir.

Mr. HAUGEN. And $150,000 is suggested now for the testing of the serum. We then have $300,000. Estimating the cost of the plant at $3,000,000, the expenditure of $300,000 would amount to 10 per cent on $3,000,000; that would be 10 per cent on the $3,000,000 investment?

Mr. MCLAUGHLIN. You are not allowing anything for operating.

Mr. HAUGEN. We are not taking that into consideration now. We are now taking into consideration the cost of the plant, buildings, and all things necessary to equip them ready to start in business. According to Dr. Melvin's estimate as to cost of the plant, $3,000,000, eliminating the cost of the inspection of the 86 plants and the expense of testing the serum, equals 10 per cent on the investment.

Mr. RUBEY. Now, Mr. Chairman, let me ask this question: In addition to that, after you have your plants established, what would be the annual cost of operating those plants?

Dr. MELVIN. Dr. Dorset has given me the figures at about 1 cent per cubic centimeter as the cost of production.

Mr. RUBEY. Yes; but in addition to producing it, you have to make your arrangements to supply it to the people all over the United States.

Mr. HAUGEN. The fact of it is these plants are all self-sustaining. I take it they are not selling serum for 1 cent when it costs anything in excess of a cent. I take it they are all operating at a profit, and that includes a profit or dividend on the investment.

Mr. HELGESEN. Do you think the 86 establishments which you mentioned, if they were running at full capacity, could manufacture enough serum for this country?

Dr. MELVIN. The season of the prevalence of hog cholera varies. Take the year around, on the average, they probably could. These plants at this time of the year make very little serum.

Mr. HELGESEN. I understand.

Dr. MELVIN. Then in the summer, in the early summer, they commence to manufacture at full capacity. In connection with the States they seem to have supplied what was required. Of course, the demand is going to increase a great deal, because there are farmers even to-day who have never heard of hog-cholera serum. As the people appreciate the benefits of good serum the demand is going to increase more and more. I venture to say that in five years from now there will be three times as much used as at present, if cholera continues in the same proportion.

Mr. HELGESEN. The value of the 86 plants, at $40,000 each, which is the top price estimated, would amount to $3,440,000. And certainly if they were consolidated into larger units they could manufacture very much more cheaply than they do now. There would not be the overhead charge in 10 establishments that there would be in 86, and a great many other expenses would be eliminated.

Mr. LESHER. I am not so sure about that. Where a man is looking after profits for himself he is going to give the business closer attention than where he is working for somebody else.

Mr. HELGESEN. If that is the case I will ask this question: Is it not a fact that the department as a matter of policy is opposed to manufacturing anything for sale?

Dr. MELVIN. I do not know that we have ever established a definite policy along that line.

Mr. HELGESEN. I notice there are always objections to it.

Mr. LEE. I know of only two men in my county who have used hog-cholera serum during the last two years—my brother and myself. In a section like ours there is not one farmer in 500 using it. I would believe in building these plants if it would result in producing ten times as much serum as is now being used. If they got to using it generally the output would be increased very much.

Mr. RUBEY. How about hog cholera in your country?

Mr. LEE. Our farmers are not using the serum.

Mr. HAUGEN. I believe that same statement is true as to my section. I do not believe you could hire the people to use it; I do not believe you could give it away.

The CHAIRMAN. For what reason, Mr. Haugen?

Mr. HAUGEN. Two years ago they tried it. It was fairly satisfactory at the beginning of the season, but later on they discovered it had no value whatever. The people in my section of the country are very much prejudiced against it.

But what I was getting at, Mr. Chairman, is this: It has appeared to this committee that the most important thing of all is the potency of the serum. We now find 86 factories manufacturing this serum,

and we also find that the serum has spread the foot-and-mouth disease, and of course the people naturally are prejudiced against a serum or anything that spreads the foot-and-mouth disease. That information comes from the department, and I take it it is not denied. If potency is of any consequence whatever, as I assume it must be, then we must provide for a potent serum. It has not been satisfactorily provided for. The serum is expensive. I assume that it could be manufactured by the Government and furnished to the consumer at a less cost and by eliminating this \$500,000, as has been pointed out, appropriation could be reduced to that extent under the proposed plan. I believe it would be possible to furnish the people with a potent serum that might be of some value at a reasonable price and at the same time give it a standing in commerce and with the people.

Mr. MCLAUGHLIN. But there is another thing that occurred to me: After all I have heard, I doubt very much if this work of inspecting the factories amounts to anything. Dr. Dorset has said this morning, and it is in line with what has been told us several times before, that the best kind of inspection of a factory that can possibly be made may not reveal the defects in the serum; that really the only way to determine whether or not the serum is good for anything after it is made is to put it to an actual test. And then we have been told, too, that inspection that would really inspect and find out just how each and every one of those factories is doing its business would cost so much that we could not afford to appropriate the money.

The CHAIRMAN. Let me inquire, Mr. McLaughlin, as to this proposition of Dr. Dorset's.

Assume, Doctor, that you are absolutely controlling the output of serum in this country—manufacturing it—can you give to this committee a guaranty that all the serum that you put on the market is going to be absolutely potent? In other words, can you guarantee to this committee and to the country that some of your folks are not going to make an error sometimes?

Dr. DORSET. No, sir; I do not think it is possible to make such a guaranty, even though the Government makes the serum itself. Of course, Government men are liable to err at times. I feel that the system of private production under inspection and subsequent testing by the Government, as suggested in the Secretary's report, will probably give as good results as if the department made the serum itself; and I believe it would be less expensive to the Government in the end.

The CHAIRMAN. We could talk here on that proposition always. It is a very important proposition, but let us get down to a couple of basic facts.

These appropriations were made in the beginning for experimental purposes. That was the understanding of the committee and it was the understanding of the department. We expected you to expend this money with the view of determining, if you could, whether or not you could check the ravages of hog cholera—whether or not you could eradicate hog cholera from this country. You have been doing this work now in a large way for two years. We are hoping that the department during that time has reached some definite conclusion as to what the policy of the Government in reference to hog cholera should be in the future.

Three plans suggest themselves to my mind. One is the continuance of the idea of attempting a complete eradication of hog cholera your county-unit work.
Another proposition is the ownership and manufacture of the serum country uses.
The third is some kind of a plan such as is suggested in the Secrey's annual report which was read into the record.
Now, I would like to get from Dr. Melvin and Dr. Dorset their lgment as to what is wise. First, is there any possibility, under ur present method of procedure, of our ever being able to eradicate cholera as we are trying to eradicate cattle tick? Let us have a inite answer to that proposition, if possible, and then we will take the other two.
Dr. MELVIN. I do not think there is, within any reasonable length time.
The CHAIRMAN. Now discuss that for a moment, Doctor.
Dr. MELVIN. The disease is just about as contagious as the foot-l-mouth disease and spreads in as many ways—by carriers, being ried mechanically by animals of all sorts and breeds, by corn fod-, by streams, and in various other ways. It is general throughout United States; probably there is not a State in the Union that has more or less hog cholera in it. To go at the thing with a view a complete eradication would require as stringent measures as we ve been enforcing in the eradication of the foot-and-mouth disease. would require an expenditure of many millions a year and would n occupy a number of years.
Mr. HAUGEN. The same method would have to be applied as in the t-and-mouth disease—the slaughtering of the animals, or the arantine?
Dr. MELVIN. Not necessarily slaughtering, because in this case we ve a serum that can be used. In the case of the foot-and-mouth ease we do not have a serum that can be used. We can give hogs rmanent immunity from hog cholera, but there is no way by which can give permanent immunity to cattle from the foot-and-mouth ease. So it would not require, in all cases, the slaughtering thod.
Mr. HAUGEN. But quarantine?
Dr. MELVIN. A stringent quarantine method would be so irksome the people that I do not believe they would tolerate it.
The CHAIRMAN. Therefore you dismiss the idea of permanent adication under the present method?
Dr. MELVIN. At the present time. There may be some time in e future when the disease will have been reduced to such an extent at by very vigorous efforts on the part of the Federal Government might be eliminated. But that time is not in sight now.
Mr. RUBEY. Your idea, then, Doctor, is that the experiments ich are taking place in those 17 counties scattered throughout the ited States should cease?
Dr. MELVIN. As I think the chairman has indicated before, that s in the nature of experimental work—demonstration work. We ve secured certain information from that experimental work which, hink, is very valuable and shows what can be accomplished by tematic efforts in a small area. I think it is worth while either the Government to consider continuing it or for the States them-

selves to keep it up along those same lines. It would seem to me that if that line of work is to be continued by the Government, in order that the country might get the full benefit of it it ought to be transferred to other counties—possibly to counties in other States—so that this same sort of information could be disseminated more largely in this way.

Mr. RUBEY. Do you not think by pursuing that plan—say, for instance, ceasing your work in those 17 counties and taking it up in 17 or 20 other counties—that you could demonstrate to the people in various communities here and there over the country the feasibility of counteracting this disease?

Dr. MELVIN. I think probably we could disseminate the information at the same expense over a much larger area through our men who have been doing demonstration work with the county agents and the farmers' associations making demonstrations of the use of the method, without such close supervision of the work and actual treatment of the animals themselves.

Mr. HELGESEN. I think that is a practical idea.

Mr. RUBEY. I notice in this book I have before me here, your Program of Work, that this is for research work to determine the most effective methods of controlling hog cholera in selected areas. That is where you have been doing it for the last two or three years. You think, then, possibly we could get better results by discontinuing that particular work and, through cooperation with the agents in the various counties and by sending men to those counties and having demonstrations there, you could accomplish more than could be accomplished by continuing the experimental work in those particular counties?

Dr. MELVIN. I think you could with reference to the general knowledge of hog cholera. Of course, we can go into different counties and take up the work of treating infected and exposed herds and show a great financial gain. We have done that already in these counties where we have been at work for the last two or three years. At the same time I do not think that the general information regarding hog cholera and measures of combating it could be disseminated to as large a number of people in that way as by this demonstration work which you have indicated.

Mr. LEE. Even in the 17 counties you have not succeeded in eradicating it entirely, have you?

Dr. MELVIN. No, sir. As I say, it is very contagious. In one county of Iowa they went nearly all of this year without any infection. I think there were only two or three cases up to this fall, when suddenly the disease broke out in a number of places over the county.

Mr. HAUGEN. That is true as to the whole State there, is it not—in all areas where you had hog cholera? For instance, in my section we had hog cholera two years ago, and this year we had very few cases at all. And is it not true that it generally breaks out in the fall?

Dr. MELVIN. Yes, sir.

Mr. HAUGEN. Is that not true of the whole State, and is it not a fact that this has now gotten beyond the experimental stage?

Dr. MELVIN. I think, so far as the use of the serum for combating hog cholera is concerned, that it is beyond the experimental stage.

HAUGEN. And your contention is that, if a potent serum is ed, you have an absolute cure for the disease?
MELVIN. A preventive.
HAUGEN. A cure and a preventive?
MELVIN. Yes.
HAUGEN. The position the committee took two or three years s that it had gotten beyond the experimental stage and that it en up to the department to demonstrate its value. Now, is it fact that its efficacy has been demonstrated in nearly every in the whole of the United States where hog cholera prevails?
MELVIN. No; I do not think it has, Mr. Haugen. There are a nany counties all over the United States where people know ry little about it. Suppose a farmer has sent off and bought a of serum from some manufacturer and brought it home and . He may use it properly or he may use it improperly. If he od results, he swears by the serum; if he uses it improperly and d results, he condemns it and tells all his neighbors not to have ng to do with it.
, there is a great deal of information along that line as to how the serum—how to properly use it—that needs to be put the people. Mr. Lee indicated in his section how few farmers ed it. That is true all over the country. We have run across s right in the heart of a hog cholera district who have actually heard of antihog-cholera serum. One of the officials of the f Missouri told me recently of a man who lived within sight of lant at Columbia, Mo., who allowed hogs to die of hog cholera t having attempted to use the serum.
HAUGEN. Less than a year ago I was talking with a party 40 miles of our State capital who had never heard of Wash- ; so I take it that all people do not know about the serum; e fact is, the people generally know about the serum, especially who have lost hogs by hog cholera.
LEE. How long does this disease stay in the soil after you take gs away; how long will the bacteria live?
MELVIN. We do not know definitely; it varies under different ions of temperature and atmosphere.
LEE. Will it take a year or six months to get rid of it?
MELVIN. We do not know.
WILSON. Is it not true, Doctor, that the hogs will have cholera ar and the next year not have it and live on the same pasture the same pens?
MELVIN. They will do that, sometimes, in less than a year, and er times they have it under the same conditions. It is probable limatic conditions and conditions of temperature and atmos- have a great deal to do with it. These conditions are so varied ; is impossible for us to make close studies to determine that.
HAUGEN. In my country two years ago and a year ago we had holera. We had experts from the department out there, and lid some good; but nearly everybody lost hogs. I lost all I cept three or four. Immediately I went and bought hogs, and it disinfecting the pens put them in the same pens. The hogs t did well.
HOWELL. Did you do that for experimental purposes?
HAUGEN. For experimental purposes; yes.

The CHAIRMAN. What conclusion did you reach?

Mr. HAUGEN. I did not lose any hogs; they all did well.

The CHAIRMAN. But what conclusion are you willing to give the committee? Is it that these hogs were immune?

Mr. HAUGEN. My conclusion is that the disease is not as contagious as contended by many. We have had hog cholera for a generation about every 10 or 15 years, and in the meantime we have been free from it.

Mr. OVERMYER. Has it been determined that there can be hog cholera without any original infection?

Dr. MELVIN. There must be some preexisting infection, just as in the production of eggs there must have been some hens.

Mr. OVERMYER. Yes; I understand that.

Mr. RUBEY. As a result of your investigations, Mr. Haugen, is it your opinion that we should discontinue all work in reference to hog cholera and let the whole thing go?

Mr. HAUGEN. I do not believe we should discontinue it, but in view of the fact that serum is spreading the foot-and-mouth disease and that it seems impossible to secure a potent serum I believe we should go slow in making appropriations and that we should get down to something practicable.

Mr. RUBEY. Is it not a fact that the amount of foot-and-mouth disease thus spread was very small indeed—less than one-tenth of 1 per cent?

Dr. MELVIN. Mr. Chairman, I would like to make the statement that the foot-and-mouth disease was spread only from two plants in one locality. That infection originated before the department or anyone was aware of the existence of foot-and-mouth disease in that section of the country. It was only through the supervision of these plants that we were able to trace quickly where this serum went to, and it was only through that supervision that we were able to confiscate the balance of this contaminated serum, which, unless the Government had been supervising it, would undoubtedly have been sent out and produced many times more cases than were produced.

Mr. MCLAUGHLIN. By what kind of inspection did you discover that? Was it not by testing the serum?

Dr. MELVIN. The serum was tested. It was thoroughly tested. A test was made much more severe than we use ordinarily. The animals upon which we tested it showed no evidence whatever of foot-and-mouth disease. They remained healthy, and when placed with other hogs the other hogs remained healthy. Each one of those batches of serum, which is made from a large number of hogs, is kept separate and required to be provided with its serial number. Those batches are mixed thoroughly, and then samples are taken and tested on other exposed animals; and that was done in this case.

When the foot-and-mouth disease appeared on several farms, we were able to go back to the books of this company and trace where the balance of this particular batch had been shipped by the serial number. Those records are required to be kept by the department. In that way we traced definitely where all of the serum had gone. In two or three instances we slaughtered the animals immediately without waiting for the development of the disease, and there was no further development of the disease in those localities.

CHAIRMAN. Doctor, if you had authority to test those serums hey went from those manufacturing plants, you would reduce eatly the probability of any such thing recurring, would you

ELVIN. If we had all of them under our control, as the Secre- s recommended in his report, the advantages would be much for the department and for the people.
VILSON. Did you not inspect the serum that went out and this foot-and-mouth disease? Take this Chicago case.
ELVIN. That is the only case there was.
VILSON. I do not know of any other; but wasn't that serum d by the Government?
ELVIN. That serum was made in October of 1914. The foot- uth disease was found in the stockyards of Chicago, and all m held by this plant and by another plant which adjoins the rds was withheld on account of the great amount of work we do in consequence of the foot-and-mouth disease. It was p and held and not tested until in July, 1915. There were imals injected with varying amounts of this serum, from 20 bic centimeters; these hogs were observed for 15 days, and lopments occurred. They withstood both injections of serum virulent blood and remained well. They also showed no evi- f any foot-and-mouth infection. Two other hogs which we with the hog-cholera virus and which did not have the pro- serum died of hog cholera. That proved the potency, so far holera was concerned. Then those hogs were sold and were by a farmer, who placed them with his hogs; and they re- healthy up to the time they were last examined, which was atter part of the fall.
ELGESEN. Now, Doctor, you have been expending two or undred thousand dollars a year for county demonstration You have been demonstrating——
ELVIN. Both of those lines of work.
ELGESEN. In the 17 counties?
ELVIN. Yes.
ELGESEN. You have in those counties demonstrated what done, have you?
ELVIN. Yes, sir.
ELGESEN. And there would not be any greater benefit by ing that, so far as you are concerned, than what you have accomplished? If that is true——
CHAIRMAN. Let him answer that. I was going to ask that n myself.
ELVIN. I think there would be a benefit by continuing it; ndoubtedly would be; but whether it is to be continued in- ly or not is a question for the committee.
ELGESEN. Is it not a fact now that the important thing to disseminate the knowledge you have among the people?
ELVIN. Exactly.
ELGESEN. And do you not think it could be better done, as d, by having the county agents go out and attend farmers' s and have them make demonstrations right before the —to show them how it is done – than to have it done in a few localities here and there?

Dr. MELVIN. I think you would cover a larger amount of territory with the money expended in the way you indicate.

Mr. HELGESEN. I have attended a number of meetings where the farmers have asked the question, "How do you do this?" and the agent has been unable to give the farmer any real conception of how it is done. It seems to me that with this special demonstration work we have had, confined to a few small communities, it is now time to start to disseminate this knowledge in a more liberal manner; and I do not believe it could be extended in any better way than for the county agents to go into the country districts and attend the farmers' meetings and show the farmers just how it is done. It seems to me it ought to be done in that way.

Dr. MELVIN. Before we get away from this foot-and-mouth infection by this serum, I have a statement here which was prepared by the department, and which I would like to insert in the record.

The CHAIRMAN. Without objection that will be ordered.

Mr. HAUGEN. What is the character of the statement? What is it about?

Dr. MELVIN. It is a statement in general along the line on which I have spoken with reference to inspection and testing of this serum, etc.

(The statement referred to follows:)

SERUM TESTS AND THE FOOT-AND-MOUTH DISEASE.

OFFICIAL STATEMENT OF THE ORIGIN OF THE PRESENT OUTBREAK IN NORTHERN ILLINOIS.

WASHINGTON, D. C., *October 30, 1915*

An official statement in regard to the recent reappearance in northern Illinois of the foot-and-mouth disease, after it had been apparently stamped out early in the year, was issued to-day by the United States Department of Agriculture. From this statement it appears that the outbreak has now been definitely traced to an anti-hog-cholera serum prepared from the blood of hogs infected with foot-and-mouth disease, but showing at the time the serum was manufactured no symptons of the contagion. According to the statement, the serum was thoroughly tested before it was permitted to be placed upon the market, and the tests failed to reveal any evidence of contamination. After the recurrence of the disease in Illinois, samples of the serum were tested again and again by the Department of Agriculture and also tested by the United States Public Health Service. It was not until the sixty-second animal used in the tests had been inoculated with the serum, however, that the bacteriologists of the department were able to produce any symptoms of foot-and-mouth disease.

The department's statement is as follows:

In October, 1914, an outbreak of foot-and-mouth disease—the first in this country in six years—was discovered in the vicinity of Niles, Mich. Despite thorough investigation, the source of the infection remains unknown. It was learned, however, that before the occurrence was reported to Washington and the disease diagnosed by veterinarians familiar with it through experience in past outbreaks, animals from the infected area had reached Chicago. Owing to the extreme contagiousness of the disease the Union Stock Yards were quarantined October 31st. Ordinarily, several days or a week elapse between infection and the appearance of symptoms, and although there was no conclusive evidence on the point, it was believed possible that the animals in question might have reached the yards in the incubative stage and infected them.

On November 3 this belief was strengthened by the discovery of the disease in the cattle being exhibited at the dairy show in the immediate vicinity of the yards. In the yards proper, however, the first case did not appear until November 8. The next day foot-and-mouth disease was found among the hogs at the establishment of the Morris Western Soap Co. This establishment was quarantined at once, and at about the same time a precautionary quarantine was also placed upon another estab-

lishment, that of the Chicago Serum Co., located about a mile away, although no actual cases of the disease had been found at this second establishment. At that time the Chicago Serum Co. had on hand approximately 101,000 cubic centimeters of an antihog-cholera serum which had been prepared late in October. All of this serum was placed under official seal by the inspectors of the department and withheld from distribution.

During the ensuing six months the disease, which had spread widely over the country was effectively combated by the slaughter of all exposed herds. It was then decided that the law required the department to comply with the request of the Chicago Serum Co. for a test of the serum in order that, if it were found safe, it might be placed upon the market. The national serum law gives the department no authority to refuse to permit the sale of a serum unless it is contaminated, dangerous, or worthless.

Arrangements were accordingly made by the Chicago Serum Co. for a test under the supervision of the department. Forty-one thousand cubic centimeters of the serum were thoroughly mixed and rebottled, and on June 30 samples were injected into eight small hogs. Two check hogs were also included in the test. Although injections as large as 49 cubic centimeters were used, it is certain that none of these hogs developed foot-and-mouth disease. The test being thus absolutley negative; that is to say, no indications of the disease resulting from it, the company was informed that it could ship out the serum to its customers.

On August 8 the inspector in charge of field inspection at Chicago telephoned to Washington that a case of foot-and-mouth disease had been discovered in a herd which had been inoculated with this serum in Cook County, Ill. Pending investigation, all shipments of serum produced in Chicago were at once prohibited. As a result of the investigation, it was found that serum from the Chicago Serum Co. had been used on 11 herds of hogs, 8 of which were in Illinois and 1 each in Minnesota, Michigan, and Indiana. Inspection showed that eight of these herds were infected with foot-and-mouth disease, although only a very small percentage of the hogs in them manifested symptoms of the disease. All the animals, however, were slaughtered at once. The three herds in which no disease was found were also slaughtered without waiting to see whether they would subsequently develop the disease or not. This measure was necessary on account of the risk that the disease might be spread by the animals while in the incubative stage. As a result of the precaution, no further cases have been reported from Michigan, Minnesota, or Indiana.

In addition to these measures adopted to control the spread of the disease, samples of the serum actually used were procured from the owners of the infected herds and also samples of the remaining stock of the Chicago Serum Co. Pigs and calves, the animals which are most susceptible to foot-and-mouth disease, were inoculated with these samples. The results were again negative and, after two series of tests had been made, the United States Public Health Service was asked to conduct a third series. This also was negative.

Up to this time, therefore, four series of tests had been made, in which a total of 52 animals had been used. None of these 52 animals developed foot and mouth disease, and the inoculations afforded no evidence that the serum was in any way contaminated. Each subsequent series apparently only confirmed the original test made before the serum was permitted to be placed upon the market. The fact remained, however, that herds treated commercially with the serum had developed foot-and-mouth disease. A fifth test, therefore, was made, and ten days after inoculation the sixty-second animal which had been used in the tests, a calf which had received 30 cubic centimeters, developed characteristic lesions. The diagnosis of foot-and-mouth disease was subsequently confirmed by the inoculation of other animals with material from the infected calf.

This is regarded as proof that the suspected serum actually was infected. Why the standard tests used on 61 animals failed to reveal this fact is a matter for scientific investigation, and the bacteriologists of the department are now at work upon the problem. At the time of manufacture, one-half of 1 per cent of carbolic acid was mixed with the serum to act as a preservative. It is now believed that the carbolic acid, acting as a germicide, may have attenuated or partially destroyed the virus to such an extent that what have previously been considered safe tests failed to establish the presence of the infection. It is also possible that the virus, instead of being disseminated throughout the entire mass of serum, may have become agglutinated. This has been known to occur with germs of other diseases. The result would be the formation in the serum fluid of isolated clumps of foot and-mouth disease virus, while the bulk of the serum remained free from these tiny masses. If this were the case, it is obvious that certain animals inoculated with the serum would develop foot-and-mouth disease and others would escape. Up to the present, it should be stated, scientists have not been able to identify the germ of foot and-mouth disease, although the economic im-

portance of the purpose in Europe has caused it to be studied exhaustively for many years.

In the department experiments are now being continuously prosecuted with a view to discover a means of treating serum at the time of its manufacture which effectually will destroy the virus of hog-cholera disease. The results so far obtained are promising, and the department hopes that a successful method will be evolved shortly. In the meantime all the infected serum in the hands of the Chicago Serum Co. has been destroyed without compensation. All other serum manufactured in Chicago which it was believed might contain possibilities of danger has likewise been destroyed. Furthermore the department is prohibiting the shipment of any serum from licensed establishments in the future as may be under quarantine for foot-and-mouth disease.

The problem of producing serum which will be effective in controlling hog cholera and at the same time will be harmless and safe in general use is complicated by the fact that the Department of Agriculture has no authority over serum plants which dispose of their products exclusively in the State in which they are manufactured. Such establishments are amenable alone to State law and regulation. The virus act confers no authority on the department to guarantee or certify any commercial serum, nor does it provide for a continuous examination and inspection of serum establishments such as the meat-inspection law provides for packing houses. The department can only control serums and analogous products in interstate commerce when there is evidence that they are contaminated, dangerous, or worthless, or when the manufacturer is not licensed to engage in such interstate business. The virus act was passed about two years ago, and within the short time intervening before its passage and the outbreak in 1914, and with the facilities available, the department extended its inspection over serum plants just as far as the law and circumstances permitted. There were in October, 1914, about 90 serum plants holding Federal licenses located at widely separated points in the United States. This condition rendered continuous inspection very expensive and impossible with the funds legally available for the purpose.

Mr. HAUGEN. Doctor, the Secretary points to the importance of testing serums. I infer from that that he intends to convey the idea that these tests should be made by the Government in order to insure potent serum. If so, can not the Government test its own product as well as it can test the product of these 86 plants?

Dr. MELVIN. Yes.

Mr. HAUGEN. That is the only objection raised in the plan suggested by the Secretary.

Mr. MCLAUGHLIN. I wish to ask a question or two along the line that Mr. Haugen was pursuing. About this county work, you cooperate with the States always, do you not?

Dr. MELVIN. Yes, sir.

Mr. MCLAUGHLIN. And the officials of the State have an opportunity to learn in the course of a season practically all that your representatives know about this matter?

Dr. MELVIN. They have an opportunity; yes, sir.

Mr. MCLAUGHLIN. And you think that, after you have worked with them and instructed them, they are able to take up that work and do it themselves?

Dr. MELVIN. They do not do it, as a rule.

Mr. MCLAUGHLIN. But you think they are able to do it?

Dr. MELVIN. I do not know why they should not be just as able as we are. They are able, with funds, to get just as efficient men as we are.

Mr. MCLAUGHLIN. Then, it is a question of funds, is it, and the willingness of the authorities of the State to take up and direct the work and to enforce it?

Dr. MELVIN. That is largely true with all agricultural matters, except where we are ---

McLAUGHLIN. Pardon me, but is it true as to this kind of doctor? Have you been working with those State officials, ve they been cooperating with you and taking advantage of portunity of learning your methods?
CHAIRMAN. And have they been contributing anything in y of money in this work?
MELVIN. In some few instances they render aid in the way of al assistance but do not furnish any money outright.
McLAUGHLIN. Take a concrete example. You did this work in County, Mich. That is about the center, from east to west, of tern Indiana line. Was your work there such that the authori- the State who cooperated with you might have learned, and to have learned, enough about this so that they could take hemselves if the legislature furnished sufficient money?
MELVIN. I think so.
McLAUGHLIN. And what was true in Branch County is true of ounties in which you worked?
MELVIN. Yes, sir.
McLAUGHLIN. Your idea is that this county work has gone far in the 17 counties in which these experiments were con- so that the States themselves can take it up?
MELVIN. They can take it up if they are disposed to do it.
McLAUGHLIN. They have the facilities; they have the knowl- hich you have imparted to them; and you have experimented monstrated this sufficiently so that they can take it up. It a question of their being willing to do the work and furnishing ney?
MELVIN. It is, largely; yes, sir.
McLAUGHLIN. You say largely? Is there anything remaining to do in those counties?
MELVIN. These States are pretty large areas. Take a case the work has been conducted in one end of the State; if you go lred or two hundred miles away from there, you are almost in locality.
McLAUGHLIN. That is true. There may be several reasons for ivities of the Government. One is the making of experiments other is the making of demonstrations. Sometimes the trouble rge that a State ought not to be asked to do it and it can very ly ask the aid of the Federal Government in dealing with the on. But in this case, so far as the knowledge is concerned, you parted all that; at least I am asking you if you have imparted nt knowledge to the officials of the State to enable them, if they and if the legislature of the State will furnish the money, to y and fully take care of the entire State?
MELVIN. I think so.
RUBEY. I would like to know, if you can put it into the record, ount of money appropriated by each State for fighting hog . Can you do that?
MELVIN. I doubt if we have that full information. We have in States, but I do not think we have it for all of them.
RUBEY. You can not furnish that; you do not know just how States are making such appropriations and the amounts in- d?

Dr. MELVIN. No, sir. A good deal of their hog-cholera
financed out of general funds, so that I doubt if they the
would know definitely how much money is spent on hog chol
Mr. MCLAUGHLIN. Did you have proper cooperation and as
from the State and local authorities, particularly the local aut
in Branch County?
Dr. MELVIN. So far as I know, we have. I think Dr. Dorse
answer that more definitely.
Mr. MCLAUGHLIN. How is that, Dr. Dorset?
Dr. DORSET. We did not have very much financial help fi
State; we had the sympathy of the State and its moral s
we did not have very much financial assistance in Branch
Mr. MCLAUGHLIN. Did the employees of the State give ver
attention to it, so that they could make use of the informati
you acquired?
Dr. DORSET. They gave full attention to it; they have fu
mation with regard to the work; and I think they appre
highly.
Mr. RUBEY. What information have you as to the State
souri- Sedalia County?
Dr. DORSET. In Missouri we had cooperation only from th
veterinarian. Our records indicate that he has contributed
$225 a month, which is, I think, as much as any other State h
for that kind of work.
Mr. HAUGEN. How much did the Federal Government cont
How much was the expense of the work?
Dr. DORSET. The work in that county probably cost us so
under $10,000, including the cost of all the serum used in it.
Mr. HAUGEN. For the year?
Dr. DORSET. For the year.
Mr. HELGESEN. Do you require the farmers in those countie
anything for the treatment that you give them?
Dr. DORSET. No, sir; we use the serum free.
The CHAIRMAN. Let us get back to the proposition, gen
Dr. Melvin, you say that your experiments in your demons
work in these 17 counties have given you about the informat
started out to get; is that right?
Dr. MELVIN. Yes, sir.
The CHAIRMAN. And that information is available to th
lic now?
Dr. MELVIN. Yes, sir.
The CHAIRMAN. And that you have demonstrated, as far
can demonstrate it, that you can eradicate hog cholera if yo
enough money and enough men and enough rules and reg
with which to do it; is that right?
Dr. MELVIN. I think that is a safe statement.
The CHAIRMAN. All right. I am going to follow up M
Laughlin's line of questions, because I think they are import
the States desired to continue this work of complete eradicati
would have to appropriate the money with which to do it, a
would have to do it themselves unless the Federal Governmen
is that true?
Dr MELVIN. Yes, sir.

The CHAIRMAN. Would you recommend, in view of your experiments and investigations so far made, that the States, or that the Federal Government, or that the States and the Federal Government cooperating and combining, undertake the general proposition of complete eradication of hog cholera in the United States? Now, that is the thing in a nutshell, it seems to me, that we are trying to get it, is it not, Mr. McLaughlin?

Mr. MCLAUGHLIN. Yes, sir.

The CHAIRMAN. That is what I think you were trying to bring out in your question. Let us see if Dr. Melvin can tell us about it.

Dr. MELVIN. I thought that Mr. McLaughlin directed his question more to the information upon hog cholera in general, without referring to complete eradication. I do not believe it is ever going to be possible to make complete eradication of hog cholera unless you can get the joint cooperation of all the States with the Federal Government. No State can eradicate hog cholera completely and maintain the State free without the cooperation of the Federal Government and at least the adjoining States.

The CHAIRMAN. Do you think that the public mind is in such condition—the minds of the farmers—on this proposition that even with the cooperation of the States with the Federal Government you can at any time in the near future evolve a method by which you can get complete eradication?

Dr. MELVIN. No; I do not think so.

The CHAIRMAN. That is the point we are driving at. If you can not do it, we want to know it, so that we can dismiss that from our minds and take up the next proposition.

Now, what about the Government controlling and owning manufacturing plants for serums? Let us have your views on that proposition. That is the other plan suggested. What are the objections to it and what are its advantages?

Dr. MELVIN. My opinion is that the Federal Government should maintain close supervision over commercial plants that are manufacturing serum. I think that is preferable to its undertaking to manufacture it. There are objections to that. It does not seem to me to be an equitable thing to put all of these men out of business who have invested their money in it. They have gone into the business in good faith; and, if they are preparing a proper serum, I do not see any advantage in depriving them of their investment.

Mr. OVERMYER. I was going to ask you, if you will pardon me, what authority the Government would have to prevent any one from going into the manufacture of serum if they make a good product?

Dr. MELVIN. We could not——

Mr. MCLAUGHLIN (interposing). For use within the State.

Dr. MELVIN (continuing). If they confined their business within the State.

Mr. MCLAUGHLIN. You might prevent its shipment in interstate commerce.

Mr. OVERMYER. That is, the Government could regulate it; but how could the Federal Government prevent a private citizen from engaging in any line of business if he produced a good product?

Mr. RUBEY. You might say that they could not use it on hogs that were to be sent into interstate commerce.

The CHAIRMAN. Now, what other objection is there? Let us carry on this inquiry as to hog cholera on the same lines.

Mr. HAUGEN. It is a proper function for the Government to manufacture and distribute the blackleg vaccine, is it not?

Dr. MELVIN. Yes.

Mr. HAUGEN (continuing). Free of charge—to manufacture and distribute it free of charge; and, if so, why should that not also be applied to the hog-cholera serum? What distinction is there?

Dr. MELVIN. The great distinction is that in the manufacture of blackleg vaccine the cost is practically insignificant. They are two very different propositions, financially and administratively. One involves the outlay of an immense amount of money and requires a great deal of administration. The other costs but very little—only a few thousand dollars a year—and accomplishes a tremendous amount of good.

Mr. HAUGEN. Yet Congress should not discriminate between a large or small concern, or a large or small investment, should it? The man who has a $25 investment is entitled to the protection of the Government just as much as the one with $50,000, I think.

Dr. MELVIN. There are a number of commercial firms making blackleg vaccine which are under supervision the same as these serum manufacturers are.

Mr. HAUGEN. And still you manufacture and distribute it. The Government is engaged in the business in competition with the manufacturers of the blackleg vaccine.

Dr. MELVIN. The principle is largely the same, but there is a very great difference in dollars and cents.

Mr. HELGESEN. But eliminating the question of cost, do you think, or do you not think, that, if the Government manufactured all that was used in interstate commerce, the results would be better than they have been so far?

Dr. MELVIN. I do not see how they could be better. If a private concern puts up the equipment such as we would have, employs the same technical assistants in making it that we would be able to employ, I do not see that we could improve to any extent over that by making it ourselves.

Mr. HELGESEN. In making it for profit, as they do, do you not think they would take longer chances than the Government would, which would not make it for profit?

Dr. MELVIN. We do not aim to allow them to take chances. That increase for supervision and test stations is asked for for the purpose of preventing their taking chances and to enable us to know absolutely what the serum will do.

Mr. HELGESEN. I asked you some time ago if it was not the policy of the Government not to engage in any kind of commercial business, and you said at that time, as I understood it, that you did not know that they had any policy at that time. Later, you said that your reason was that you did not want to interfere with the concerns that had already invested money in it.

Dr. MELVIN. That was my own thought in the matter but not——

Mr. HAUGEN (interposing). The fact is that the Government is engaged in the business of manufacturing and distributing a number of articles—for instance, the blackleg vaccine; and, I believe, in the

Bureau of Plant Industry, they are now distributing the nitrogen-fixing bacteria——

Dr. MELVIN (interposing). Do you mean the free seeds?

Mr. HAUGEN. No, not the free seeds; to inoculate the soil.

Dr. MELVIN. But they do distribute the free seeds.

Mr. HAUGEN. They do distribute the free seeds; but I had in mind another item, and there are numerous others in various bureaus. Why should one be discriminated against? If it is proper to do one, why is it not proper to do the other? That is the question I had in mind. I have a distinct recollection of your recommending a few years ago the establishment of a laboratory here in Washington, I believe, at a cost of about $200,000—I take it that you have changed your mind as to that?

Dr. MELVIN. I think, Mr. Haugen, that when I made that recommendation it was with the qualification that, if the department was to continue in this county work, making large quantities of serum for this experimental work, we ought to have a better equipment not only for that but also for experimental work. I would like to see that even now.

Mr. HAUGEN. Now, the question arises in my mind, is it proper for this Government to manufacture its own serum, a potent serum, and distribute it in the 17 counties to be selected free of cost, and to impose upon the other counties of the United States an impotent serum such as is likely to be manufactured and sold and which is practically acknowledged as impotent at a high cost. I take it that you will admit that, with the test applied, in administering the supposed contaminated serum to a healthy animal, powerful and more resistant than another. it might not affect that animal or infect it with the foot-and-mouth disease, where in other cases it might. I think I have argued that with some of your experts in the department who take the position that it might affect one animal and not the other, if so the test, after all, would have to be applied not only to one animal but to a number of them to make the test absolutely sure.

Dr. MELVIN. That applies to practically all biological products not only hog cholera serum but to all these other serums; you will find a resistance in one animal that you will not find in others.

Mr. HAUGEN. And an animal with greater resistance than the average might be selected?

Dr. MELVIN. There is not such a variation, however, as to make that an infallible rule, you see; it would be the exception rather than the rule.

Mr. HAUGEN. Is this serum made in large batches?

Dr. MELVIN. Yes, sir.

Mr. HAUGEN. Would it vary in quality?

Dr. MELVIN. Yes, sir.

Mr. HAUGEN. From the same batch?

Dr. MELVIN. Each batch is thoroughly mixed, so that when that is sent out it is all of the same potency. But it is possible to have one batch where you would have to use 50 cubic centimeters in order to get the same results as with another batch where you would use 30 cubic centimeters.

Mr. ANDERSON. Is there any way by which the Federal Government can determine that?

Dr. MELVIN. Only by these tests.

Mr. REILLY. What work, if any, is done in your department in the way of discovering the cause of hog cholera?

Dr. MELVIN. No specific work along that line is being done now. It has been demonstrated that it is a filterable virus; and, until more powerful microscopes or other ways of studying bacteria are developed, we can not do much more on that line.

Mr. REILLY. Is there nothing the farmer can do in the way of taking care of his hogs to prevent the occurrence of cholera?

Dr. MELVIN. I misunderstood your question. I thought you had reference to the specific cause or germ of the disease. Yes; we are giving attention to the various ways in which hog cholera is carried from one farm to another and advising the farmer how to avoid those avenues of contamination.

Mr. REILLY. What would Mr. Haugen's experiment indicate, where he put a new lot of hogs into a place where infected hogs had died and the new hogs lived there?

Dr. MELVIN. I do not think that had much significance except in that particular case, because we do know, as a general rule, that, if susceptible animals are put into premises where hog-cholera animals have been but a short time before, the new animals will contract cholera. I do not think Mr. Haugen will deny that.

Mr. REILLY. What interested me was that I read an article some time ago the main argument of which was that hog cholera was due to the feed or a failure of the farmer to properly feed his hogs and that certain farmers were getting away from hog cholera by combining different rations.

Dr. MELVIN. I do not think that goes very far. We find hogs that are raised under the most insanitary conditions and with the poorest kind of feed which, if they are not exposed to cholera, will remain healthy, so far as cholera is concerned. Yet, as a general proposition, well, vigorous animals will resist disease better than those whose health is impaired from poor feeding. That is a general rule with reference to disease.

Mr. REILLY. This article that I read seemed to indicate that it was not a question of a poor food or a rich food but a wrong combination of foods. The writer claimed that what he called a balance ration would prevent hog cholera. I do not remember whether he said it was too much corn or what it was; but he had evidence in his neighborhood (I did not keep the article and I do not know whether he was a man of any standing) that the department ought to investigate more along the line of what the farmers could do in the way of feeding to prevent hog cholera than what to do after the disease had developed.

Dr. MELVIN. Yes, sir. We have made studies along that line, and we are not of the opinion that any particular method of feeding will prevent it.

Mr. HAUGEN. Is it not a fact that hog cholera makes its appearance at the time that soft corn is fed—in the fall?

Dr. MELVIN. It makes its appearance ordinarily in the fall at a time when soft corn, if there is soft corn, is present.

Mr. HAUGEN. Well, new corn?

Dr. MELVIN. But it will come along in the fall just the same if all the corn is hard.

Mr. HAUGEN. You have investigated that matter, have you?

Dr. MELVIN. Yes, sir.

Mr. ANDERSON. If we eliminate the idea of wholly eradicating hog cholera and the idea of the Government manufacturing all the serum, and abandon the county work that is now being done, is it your idea that some sort of demonstration or educational work would then be carried on under some other appropriation?

Dr. MELVIN. No; we have no other appropriation under which to carry on the specific work along that line; but it is my opinion that greater knowledge would be disseminated, or that knowledge would be disseminated to a greater extent, by this demonstration work than along these other lines.

Mr. ANDERSON. The question in my mind is as to whether the men who are now doing county-agent work, or demonstration work, could, in addition to the work they are now doing, do the hog-cholera demonstration work, or whether you would have to have an entirely new field force to do that work?

Dr. MELVIN. Do you mean the State county agents? I do not know that I quite understand your question.

Mr. ANDERSON. What I mean is, whether you now have in the field any force of men who could do demonstration or educational work along hog-cholera lines, or whether you would have to create a new force to do that kind of work, if you are going to do it?

Dr. MELVIN. We have these two lines of work going on now in the field; one being the county work, where we are undertaking to eradicate the disease in the county, and the other the demonstration work. Those forces would be available, provided funds are supplied for this demonstration work next year.

Mr. ANDERSON. Then you would have to have an additional appropriation?

Dr. MELVIN. Yes, sir.

Mr. ANDERSON (continuing). In addition to what is given here, if you carry on any demonstrational work along hog-cholera lines?

Dr. MELVIN. Yes, sir.

Mr. ANDERSON. That is what I want to get at.

Mr. RUBEY. If you discontinue the county work, do you not think we ought to appropriate that money and use it for demonstrational work?

Dr. MELVIN. Yes, sir.

STATEMENT OF DR. M. DORSET, CHIEF OF THE BIOCHEMIC DIVISION, BUREAU OF ANIMAL INDUSTRY.

The CHAIRMAN. To continue along that line, will you allow me to ask Dr. Dorset a question? You agree with Dr. Melvin, do you not, that you have reached a point now with your county demonstration work where you feel that unless we can appropriate money enough to put it into every county in the United States—of which there are some 3,000, I believe—we ought to abandon it?

Dr. DORSET. Yes; I do, Mr. Chairman.

The CHAIRMAN. All right.

Dr. DORSET. I have regarded it as purely experimental work and the experiment has been completed.

The CHAIRMAN. The experiment has been abandoned, and that was the viewpoint and intention of the committee when the appropriation was made.

Dr. DORSET. Yes, sir.

The CHAIRMAN. Do you agree also that it is impracticable and inadvisable for the Government at this time to enter into the manufacture of these serums for distribution to farmers?

Dr. DORSET. It is my judgment, Mr. Chairman, that it is better to have the serum made by private individuals, supplemented by the Federal Government test, as provided in the Secretary's report.

The CHAIRMAN. Dr. Dorset, I would like to ask you this question, as a preliminary to some other questions: Do you under the present law test these serums and viruses, and then they go into interstate shipment?

Dr. DORSET. No, sir.

The CHAIRMAN. You do not?

Dr. DORSET. We do not test them ourselves; we require that the commercial establishments test them.

The CHAIRMAN. Exactly.

Dr. DORSET. And we have inspectors to supervise that, in a way; it is only supervisory, however.

The CHAIRMAN. You supervise them?

Dr. DORSET. Yes, sir; the tests are all controlled by the private establishments—not by us.

The CHAIRMAN. You make no actual physical tests yourself?

Dr. DORSET. No; we do not control the tests; we supervise them.

The CHAIRMAN. And you have no authority to make that kind of a test at this time?

Dr. DORSET. No; I do not believe we have.

The CHAIRMAN. If you had authority to make that kind of physical test before any of this serum went into interstate shipment at all, do you think you could accomplish the same results in guaranteeing to the people a potent and pure serum as though you were manufacturing it yourselves?

Dr. DORSET. Yes; I do, provided this Government test was supplemented by adequate inspection at the plant such as we carry on now; I think we should continue the plant inspection.

The CHAIRMAN. Then, let me ask you this: Do you indorse the suggestion contained in the Secretary's report? I suppose you do.

Dr. DORSET. Mr. Chairman, it seems to be the most practical solution of this difficulty. It will come nearer to accomplishing what we want than anything else and yet remain a practicable proposition, and one that is not too expensive. I take it that, if we purchase these serum plants—if we take over the business—the serum companies must be compensated for their business. Now, whatever the physical cost of their plants may be, we know that their profits must run around a million dollars a year—that that represents the business of these men. If the Government ever takes over that business, it would naturally have to pay for it; and I think the expense of Government ownership would be very large to establish the plant—exceeding $1,000,000—and it would involve a very large outlay to buy the other plants, or to buy the business.

The CHAIRMAN. The good will and so on?

Dr. DORSET. Yes, sir.

The CHAIRMAN. It seems to me, in working it out in my own mind, that you could not take over these privately owned plants, together with their good will, for less than from $10,000,000 to $20,000,000.

Mr. HAUGEN. In that connection, has any one suggested taking these plants over, with their good will?

The CHAIRMAN. I am applying a process of elimination to get at what the department wants, and then this committee will have the information on which to act.

Mr. HAUGEN. Yes; but no one has suggested taking over the good will or business of these people; that has never been suggested. It has been suggested to Dr. Dorset that we are now manufacturing the blackleg vaccine and that there are numerous other enterprises in which we are engaged. When we talk about condemning and taking over plants and securing the good will of private concerns, that has nothing to do with this discussion. For instance, the Government went into the banking business a few years ago; no one suggested that we should compensate the banks, or anything of the kind. That is not the only case; we have examples all along the line.

The CHAIRMAN. That is true; but I want to get Dr. Dorset's viewpoint along the line I suggested. I think that is legitimate.

Mr. HAUGEN. Why should we compensate them? Why should we secure their good will, when everybody acknowledges that they are not putting out a potent serum.

The CHAIRMAN. Allow him to answer my question, Mr. Haugen. Do you agree that, for the Government to take over these private concerns, the entire business, together with their good will, would require an appropriation of from ten to fifteen million dollars?

Dr. DORSET. I guessed the amount myself as somewhere between $5,000,000 and $10,000,000. That was my guess, and I do not think that would be far from it.

The CHAIRMAN. Yes; and your belief is that, if you are given authority to physically test this serum before it leaves the manufacturing plant and before it goes into interstate commerce at all, and if you are given the right also to see that the packages are so sealed that there can not be any tampering with them after they get into interstate commerce, you can accomplish just as much in furnishing the people with a good, potent serum and virus as though you were manufacturing it yourself?

Dr. DORSET. Yes; I am of that opinion, provided, as I said before, we have the plant inspection coupled with the test.

The CHAIRMAN. Of course, they would go together, you know.

Dr. DORSET. Yes, sir.

The CHAIRMAN. Now, if you had that kind of law and you were acting under that kind of provision and that kind of appropriation, you would still want, I take it, a small appropriation (probably a larger one than I have in mind) for the doing of educational work in the country—educating the people to the proposition of using this potent and pure serum and virus; would you?

Dr. DORSET. Yes, sir.

The CHAIRMAN. You would not want to discontinue that work?

Dr. DORSET. I feel that that work would be desirable. I made a few notes of what I thought should constitute the work of the department.

The CHAIRMAN. Let us have that.

Mr. HAUGEN. Just a moment, Mr. Chairman. I do not want to interrupt, but it seems that the Government would then be advertis-

ing, or encouraging money to, otherwise, the work of the product of private enterprise.

Dr. DORSET. Mr. Chairman, I did not understand your question, nor did I intend to indicate such a thing by my answer.

The CHAIRMAN. My question would not suggest that at all.

Dr. DORSET. No, sir; we feel merely that if the educational work is done it should be done for the purpose of instructing farmers how to save their hogs. That would be the purpose of it.

The CHAIRMAN. Exactly. Now, let us have your suggestions.

Dr. DORSET. First of all, as I have already stated, the immediate eradication of hog cholera in this country is impossible. In order to control the disease to any degree we must have cooperation between the Federal Government, the State officers, and the farmers themselves. As a result of our experimental work, we know what can be done by the use of the serum and other methods. Therefore, let the Federal Government assist the State government in educating and organizing the farmers throughout the States. As a basis for any future work, we must have the farmer educated and understanding hog cholera as well as the officials.

Now, I feel that that is one line for the Federal Government to work on.

Second, exercise control over commercial serum plants.

Third, the Federal Government should continue research work. We should have a better understanding of the cause and modes of dissemination of the disease than we have. We need to study methods for the improvement and perfection of the serum and methods of procuring the serum itself. We realize that it is not perfect in all respects and that a good deal can yet be done in an experimental way to help.

That, then, expresses my idea as to what the Government should do—those three lines of work: (1) The educational work; (2) the control of the serum plants, as suggested in the Secretary's report; and (3) further research work to determine questions such as that which arises almost every day, How long does the infection stay on the farm? As Dr. Melvin has said, we do not know; we have not definite enough information about that. A lot of work was done by the department years ago on that, but they worked with the wrong germ, and, consequently, what we find in the literature now is not true and does not apply, so far as hog cholera is concerned.

The CHAIRMAN. I take it that you would want authority to continue your experiments to determine whether or not there are impurities in these serums and viruses?

Dr. DORSET. Yes, sir.

The CHAIRMAN. So that you could detect, in time to come, the existence in them of foot-and-mouth disease?

Dr. DORSET. Yes, sir; and other research work.

The CHAIRMAN. And other research work?

Dr. DORSET. Yes, sir.

The CHAIRMAN. You are making some experiments now along that line, are you?

Dr. DORSET. Yes, sir.

The CHAIRMAN. Do you think you are reaching any conclusion?

Dr. DORSET. The experiments are not completed, Mr. Chairman. The trouble seems to be that the information we get from the literature as to foreign work is not correct.

Dr. MELVIN. On foot-and-mouth disease.

Dr. DORSET. On foot-and-mouth disease, yes; is not always correct. We have tried a system of heating the serum. We find that the serum can be heated without injuring its potency for protecting against hog cholera, and we have also been able to heat it to a temperature which foreign authorities state will destroy the virus of foot-and-mouth disease. There seems to be no very great danger in that respect; but we find that the virus is not killed by the temperature—certainly not always—stated by the foreign authorities, and that, of course, has caused some delay. But I have full confidence that, with a little work, the hog-cholera serum can be made absolutely safe against foot-and-mouth disease.

The CHAIRMAN. Suppose the committee should adopt the plan suggested in the Secretary's report; what appropriation would that kind of law need to carry for this first year?

Dr. DORSET. The first thing to do would be to establish the test station. We would have to buy land and would have to erect buildings and pens. The Secretary has indicated in his report the cost of one station to be probably about $50,000. I now believe that estimate is too small.

Mr. MCDERMOTT. How much land would you need?

Dr. DORSET. I am sorry that I have not that data right here. I have some figures on that showing the amount of land and everything; I have that available.

The CHAIRMAN. Will you insert that in the record in answer to Mr. McDermott's question?

Dr. DORSET. Yes, I will.

(The statement referred to follows:)

ESTIMATED COST OF HOG-CHOLERA SERUM TEST STATION.

Land (100 acres, at $200 per acre)	$20,000
Buildings, pens, and equipment (including offices, laboratories, power house, barn, reduction plant, water system, etc.)	130,000
Total	150,000

The CHAIRMAN. How many of these test stations do you think you will need fully to carry out your own thought in the matter?

Dr. DORSET. Mr. Chairman, I think there are advantages both ways. If we had one station under the control of one man, we would have uniformity in the tests; we could be quite sure of that.

Mr. MCDERMOTT. If I may interrupt you, do you believe in one central station?

Dr. DORSET. With one, I say that we would have the advantage of securing uniformity in the conducting of these tests. On the other hand, one test station would mean the concentration of a great deal of work at one point—possibly too much; it might be desirable to divide it and have two or three, properly located.

The CHAIRMAN. Let us assume, Dr. Dorset, that you are going to have a station located at Kansas City, and there is a plant at some other point, perhaps 150 miles away, so that your testing station is 150 miles away from the point of manufacture.

Dr. DORSET. Yes, sir.

The CHAIRMAN. How are you going to work that proposition out practically to see that nothing takes place in the meantime in the transit of this serum?

Dr. DORSET. My expectation would be that our inspector at the plant would take the sample, seal it, and forward it to our inspector at the test station by mail, by express, or however it should happen to go, and that it would be identified by the marking.

Mr. HAWLEY. Would you sequester the product in the meantime?

Dr. DORSET. The product that was made at the plant would be held under seal until this test sample had been examined at the station and the results reported back.

Mr. HELGESEN. I am informed that Canada by law absolutely prohibits the importation of hog-cholera serum and virus, is that true?

Dr. DORSET. Mr. Chairman, I do not believe there is such a law. There has been a regulation of that sort issued by the Canadian Government, and I am very glad that question came up, because I would like to take this opportunity to say a word or two in regard to that, if I may, and answer your question a little more at length. The Canadian Government has for years followed the same custom that the English Government has in combating swine fever—that is, by the slaughter-out method, very similar to our method in foot-and-mouth disease work in this country. They have not had much hog cholera there, and they have been able to keep it out by the slaughter-out method. That has been simple with them because of the small amount of the disease that they have. Now, they want to continue that slaughter-out method. Hence they do not want the serum to come in there, because the farmers then will rebel against the slaughter of their animals. That is merely a matter of policy with them—not because they believe the serum is injurious.

Mr. HAUGEN. Then, their policy differs from your policy?

Dr. DORSET. It differs in that respect. The English Government

Mr. HAUGEN (interposing). Let us get this matter clear in the record. I understood Dr. Melvin to say that if you pursued the policy of eradicating or exterminating hog cholera it would be by means of slaughter and also the use of the serum. So that your policy differs from that of Canada in that respect?

Dr. DORSET. I do not remember Dr. Melvin's statement. I think that Dr. Melvin probably said he did not think it was possible to undertake the eradication of hog cholera by slaughter in this country, and I agree with that.

Mr. HAUGEN. Well, by both?

Dr. DORSET. I did not understand him to add serum to that; I do not remember that. But the Canadian policy has been slaughter, and the English policy has been slaughter; and that has been carried out in England for the last 20 years. Now, the English Government did not succeed in eradicating hog cholera by slaughter, although they have carried on these strenuous measures for 20 years; their records show that.

Mr. McLAUGHLIN. Were they able to control it better than it is done in this country?

Dr. DORSET. They were not able to control it better than in this country, and the disease has been on the increase for the last few years, so much so that the British Government a few years ago appointed a special departmental committee, consisting of representative scientific men, to investigate the question of swine fever to see

what could be done to better conditions. That committee has just made its final report and has reached certain conclusions that I would like to read into the record if I may.

The CHAIRMAN. You may do so.

Dr. DORSET. These are the recommendations of the departmental committee appointed by the British Board of Agriculture and Fisheries to inquire into swine fever. The date is 12th of August, 1915. (Reading:)

In view of all the evidence laid before them, the committee recommend:

(1) That the attempt to extirpate the disease by general slaughter should be abandoned for the present.

(2) That the immediate object of future policy should be (*a*) to reduce mortality from the disease; (*b*) to control the spread of the disease.

(3) That in order to reduce mortality the use of protective serum without avoidable delay in infected herds should be encouraged by every possible means and, in particular, by facilitating the supply of serum.

(4) That the production of immune herds by simultaneous administration of serum and virus should be undertaken where pig owners so desire, on premises selected as suitable, and under careful supervision and restrictions.

(5) That in order to control the spread of disease, the isolation of infected premise s should be maintained by restrictive regulations, but that such restrictions should allow of the introduction of infected premises to pigs to be treated immediately with serum.

(6) That careful consideration should be given, in the light of further experience, to the extent to which existing general restrictions on movement may be relaxed as the result of new measures.

(7) That, in view of the experimental results above referred to, the lapse of a short period of time may be relied upon for disinfection of premises and should be regarded as preferable to chemical disinfection, in the case of large quantities of manure and of premises not readily capable of being disinfected by artificial means.

While the committee submit the above recommendations based on the present state of knowledge, they are strongly impressed by the possibility of artificial vaccination as a method of combating swine fever. They also recognize the advantages that might accrue from the discovery of a reliable diagnostic test for obscure cases, and they therefore recommend that investigation into this and cognate matters should be actively continued.

In conclusion, the committee wish again to record their appreciation of the zeal and ability displayed by Mr. P. S. Lawrie in the discharge of his duties as secretary of the committee and to express to him their thanks for the valuable assistance which he has rendered.

We have the honor to be your lordship's obedient servants—

Shall I read the names?

The CHAIRMAN. Yes; you may insert them.

Dr. DORSET. They are, G. L. Courthope; Charles E. Longmore, Luke White, Stewart Stockman, A. W. Anstruther, M. Locke Blake, Charles Douglas, Frank W. Garnett, and John Penberthy.

There is one little matter that I wish to speak of in connection with hog cholera, and that is about a more ready availability of the serum. I think that serum depots should be established over the country, and I have an idea that if the department did educational work such as I have suggested one of the functions of those men should be to encourage the establishment of depots for serum in counties where farmers could get it quickly when they needed it. That is the crying need; they can not now get it quick enough. They have to write too far to get it, whereas they ought to have it right there on the ground.

The CHAIRMAN. Are there any further questions?

Mr. ANDERSON. I would like to ask one or two questions in order to get this straight. You provide in this item $150,000 for the ordinary inspection work; is that correct?

Dr. DORSET. Yes, sir.

Mr. ANDERSON. Then, if the test station is established, you estimate that that will cost $50,000?

Dr. DORSET. At least.

Mr. HAUGEN. But the whole service?

Dr. DORSET. I think the estimate is that the cost of the maintenance of the station would be $150,000; but that would be paid for by the tax levied on the serum; and that the cost would be at least $50,000 for the establishment of the station.

Mr. ANDERSON. But you think that a charge should be made which would make the plant practically self-sustaining, so that it would require no continuing appropriation from year to year?

Dr. DORSET. Yes, sir.

Mr. ANDERSON. Now, what appropriation, if any, is recommended by the department for the demonstrational work?

Dr. MELVIN. We have made no provision for that.

Mr. ANDERSON. If one is made, how large an appropriation do you think should be provided?

Mr. HELGESEN. In connection with that, would they not have to take into consideration the amount of money that would be saved by doing away with the county work?

Dr. MELVIN. That would be transferred to this other line of work.

Mr. HELGESEN. Yes; but you certainly would use that money for the other work?

Mr. ANDERSON. Can we not get the whole amount—find out how much would be used for the other work, and get at in that way?

Dr. DORSET. We spent, in 9 States part of the time and in 10 part of the time, $18,382.52.

Mr. ANDERSON. That was in the county work?

Dr. DORSET. No, sir; that was in this educational demonstrational work. That meant that about $2,000 per State was what that work cost, and there was one man in each State.

Mr. MCLAUGHLIN. How much did you expend in these 17 counties?

Dr. DORSET. The total expense in the counties, including the cost of the serum, was $174,773.69.

Mr. ANDERSON. That is all I wanted to find out.

Mr. HAWLEY. Mr. Chairman, I would like to ask one or two questions on this item.

The CHAIRMAN. Certainly.

Mr. HAWLEY. The bill last year carried an appropriation of $235,000 for this work, of which amount not to exceed $75,000 could be used for dourine. I see from your project book, on page 75, you had $12,000 for one part of that dourine work, and on page 89 you had $50,000 for another part of the dourine work, making $62,000 to be expended out of that appropriation.

Now, on pages 85 and 86 of your Program of Work for the current year, there is a total assignment of $218,000; and on page 88 there is a further item of $10,000 for this hog-cholera work, making a total assignment for the hog-cholera work of $228,000.

You had $235,000 total appropriation; $62,000 of that for dourine will leave $173,000 of this appropriation for the hog-cholera work. The difference between $228,000, the total assignment, and $173,000, the balance of the appropriation, would be $55,000 more assigned to

this hog-cholera work than the appropriation seems to carry. Where does that $55,000 come from?

Dr. DORSET. I have not followed those figures exactly; but this hog-cholera work has been carried out this year with the appropriation carried in the regular appropriation bill and also with the residue of the original appropriation of $500,000, a special appropriation made in February, 1914, which has not all been expended; it has been carried along.

Mr. HAWLEY. So that this $55,000 difference came from that source?

Dr. DORSET. Anything in excess of the amount provided in the regular appropriation bill would be paid out of that other appropriation.

Mr. RUBEY. How much of that $500,000 have you still on hand?

Dr. DORSET. We expect to have in July of this year about $27,000.

Mr. HAWLEY. Suppose the hog-cholera work this year will cost $228,000——

Dr. DORSET (interposing). I can give you the exact figures better——

Mr. HOWELL (interposing). On page 86 the statement is made, "Total, investigation, treatment, and eradication of hog cholera, $218,000."

The CHAIRMAN. That is for the current year.

Dr. DORSET. This was for the fiscal year beginning July 1, 1915.

Mr. HAWLEY. My questions were directed to the point of ascertaining where, in view of the appropriation recommended in these estimates for the next year being $68,000 less than the expenditure for his year, you intended to get the money to supplement that $150,000 sked for here in the estimate to carry out your work. Will you get hat from this balance of that old appropriation?

Dr. DORSET. We expect to have about $27,000 of the old appropriation. Mr. Chairman, we had available the 1st of July, 1915, 185,000 from the special appropriation, and $160,000 appropriated by Congress in that dourine item, making a total of $345,000 available for hog-cholera work for the fiscal year beginning last July. Now, we had spent, up to the 1st of January, 1916, $146,199. That ncludes all of the items in the program of work under investigation, reatment, and eradication of hog cholera, pages 85 and 86.

Mr. HAWLEY. And 88.

Dr. DORSET. No, sir; that does not include page 88; that is another ine of work. I will explain that in a moment. On page 94 of the program of work is the item for control of the manufacture, importation, and shipment of viruses, serums, etc. That fund has carried all of that work. But the item on page 88, entitled "Supervision of the noculation of swine against hog cholera for interstate movement rom public stockyards"—is that the one you had in mind?

Mr. HAWLEY. Yes.

Dr. DORSET. That is work that is done entirely separate from this ork we are discussing.

Mr. HAWLEY. But it is hog-cholera work; that is dealing with hog holera also.

Dr. MELVIN. That is the spread of the disease; that is paid out of he inspection and quarantine appropriation.

Mr. HAWLEY. Mr. Chairman, I would like to ask the representatives of the department if they will put into the record at this point a complete statement of the hog-cholera situation, including the balance of any funds that may be available for this work and the dourine work that was formerly associated with it, so that we may see exactly the status of the work and the amount of funds available?

The CHAIRMAN. That is a very good suggestion.

(The statement referred to follows:)

Statement showing Federal appropriations available for expenditure for hog-cholera work during the fiscal year 1916, and estimated balances that will remain unexpended on June 30, 1916.

Project.	Page. Program of Work.	Original appropriation, act of Feb. 23, 1914, investigations, etc., hog cholera and dourine, $600,000 ($100,000 of which available for dourine, expended March, 1915). Balance available July 1, 1915, $185,000.	Act of Mar. 4, 1915, general expenses, Bureau of Animal Industry, 1916, eradication of hog cholera and dourine, $35,000 ($75,000 of which available for dourine). Available for hog cholera, $160,000.	Act of Mar. 4, 1915, salaries, Department of Agriculture, 1916, Bureau of Animal Industry. Estimated for use in connection with hog cholera, $6,200.	Total amount available for hog cholera.
Stores	32		$1,000		$1,000
Supervision	85		9,000	$1,000	10,000
County hog-cholera investigations	85	$46,300	76,000	2,700	125,000
Investigation of methods, etc	86	6,000			6,000
Preparation of hog-cholera serum	86	50,500		2,500	53,000
Demonstrational and educational hog-cholera work	86		24,000		24,000
Control of viruses, serums, etc	94	55,000	50,000		105,000
Total of appropriations to be used, 1916		157,800	160,000	6,200	324,000
Estimated balance of original appropriation that will remain unexpended June 30, 1916		27,200			27,200
Total		185,000	160,000	6,200	351,200

Mr. HAWLEY. I would like to ask one other question. In the latter part of item 59 of the estimates it says, "and the importation of such products intended for use in the treatment of domestic animals." What products are you importing, what is the amount that they cost, and how are they disposed of?

Dr. DORSET. This, Mr. Chairman, is not provided for the importation of products by the department, but for the control of the importation of these products by others. In other words, it requires a permit from the Secretary of Agriculture before any viruses and serums can be imported by any one.

Mr. HAWLEY. Yes.

Dr. DORSET. And it covers whatever expenses are incurred in inspection. Tuberculin may be brought in, or vaccines, or serums of various kinds, if a permit is secured from the Secretary of Agriculture.

Mr. HAWLEY. Then the word "regulating" further up in that item 59 is to be read in connection with this clause?

Dr. DORSET. Yes, sir.

Mr. HAUGEN. What is your total estimate for this year? How much are you asking for for this work—$185,000?

Dr. DORSET. $185,000.

Mr. HAUGEN. That is all that is asked for?

Dr. DORSET. I think so.

Mr. ANDERSON. Exclusive of dourine?

Dr. DORSET. The dourine item is separate.

Mr. HAUGEN. $150,000 is for inspection, and $35,000 is for what?

Dr. DORSET. $35,000 we provide for research work; for continuing the study of the disease, its mode of dissemination, its causes, improvement and perfection of the serum, and any other related matters.

Mr. HAUGEN. No estimates are made for the county work?

Dr. DORSET. I believe the practice of the department has been not to submit estimates for field work. It was a project that was originally started by Congress, and no specific estimate was made, therefore, for this county work.

Mr. HELGESEN. How much did you spend for dourine work last year?

Dr. MELVIN. I think part of that was used in foot-and mouth disease. I think it was $75,000.

Mr. HELGESEN. That is meant for dourine alone?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Are there any further questions on the hog-cholera item?

Mr. MCLAUGHLIN. If Dr. Dorset is not to be here again, I would like to ask him a question or two about this method of inspecting a factory, and the results that you reach. I gather from some of the things you have said, Dr. Dorset, that notwithstanding all the inspection you make and all you are able to do—that is, one of your men at a factory, I mean—it can not be determined whether or not the serum is what it ought to be until it is finally tested. Is that true?

Dr. DORSET. I think, as an abstract question, if I should have to answer "Yes" or "No," I should answer "Yes." Ordinarily I would want to explain my answer.

Mr. MCLAUGHLIN. If that is true, why this expense of inspecting the factories?

Dr. DORSET. Because the test itself is not absolute, and you can not determine absolutely by the test. Of course, if you could determine by the test, there would be no use of the inspection. But we know that the test of itself is not absolute and that there must be supervision at both ends, for safety. That is our judgment.

Mr. MCLAUGHLIN. Now, with regard to the manner in which you carry on the work at this testing station. This would strike me as being an immense proposition. The Government under this plan would not take up itself the making of serum; that would be left to State laboratories and to private interests. Then, the law suggested would require that samples of serum be sent to your testing station from each privately conducted factory. Would not those samples be so numerous, each one having to be tried out on a separate animal, that it would take an immense number of animals and a tract of land of immense area to make all those tests and to carry on that work?

Dr. DORSET. A large number of animals will be required, but we think it is entirely practicable. I might say that in testing this serum each individual bottle is not tested. The serum is collected in what is known as a "batch," consisting of, say, 100,000 cubic cen-

Mr. HAWLEY. Mr. Chairman, I would like to ask
tives of the department if they will put into the rec
complete statement of the hog-cholera situation
ance of any funds that may be available for this
work that was formerly associated with it, so
the status of the work and the amount of f
The CHAIRMAN. That is a very good su
(The statement referred to follows:

Statement showing Federal appropriations, etc.
during the fiscal year 1920, and estimated
June 30, 1919.

Project	[illegible]
Stores	[illegible]
Supervision	[illegible]
County boards	[illegible]
Investigation of [illegible]	[illegible]
Preparation of hog-cholera serum	[illegible]
Demonstrations in hog-cholera control	[illegible]
Control of virus	[illegible]
Total	[illegible]
Estimated appropriation pending	[illegible]

[illegible],000 batches. Tha
[illegible] batch.
[illegible]ch so made that one test of it
[illegible]urity and efficacy—if that is the

[illegible] all mixed in one large container, by cont
[illegible]plete mixture is obtained.
[illegible]low many hogs would you use to make a te

At present we employ about eight.

N. That would be 16,000 hogs?

[illegible]. Yes; about that.

[illegible]EY. Could you use the same hog twice in a year?

[illegible]. No, sir. You must remember, however, tha
[illegible] of these, the checking animals—the animals that are
[illegible] serum, but are used as controls in the test—would pro
[illegible] many cases, and, of course, be thereafter valueless;
[illegible] we use to get the serum would generally survive and wo
[illegible]re valuable than the ordinary hogs, because they would
[illegible]me, so that you would not have to pay the cost of 16,000 h
[illegible]ake the test.

Mr. HAWLEY. How many would you lose in a year?

Dr. DORSET. It would depend on how good the serum was.

Mr. HAWLEY. I mean of the check animals?

Dr. DORSET. Probably about 4,000. And their carcases, of cou
n a well-run station, would be used for the production of fertiliz
and grease; small shoats, they are.

Mr. MCLAUGHLIN. Then, your idea is to have a law passed f
bidding the shipment in interstate commerce of any of this ser
made by private interests until it has been inspected and only af
the affixing and canceling of a stamp that the Government wo
provide?

Dr. DORSET. Yes.

Mr. MCLAUGHLIN. Now, those regulations could not be embodi
in the appropriation bill, of course; that would have to be a spec
act of Congress, would it not; that would be new legislation?

...ew legislation.
And we could not put that in an appropriation
...d, but it would be subject to a point of
...Dorset, would you expect to raise your
we have not determined. We have
...ise them ourselves.
yourselves, would it not be well
over the whole hog industry?
...e with what was suggested
...cturing plants?
...s used?
...timeters of serum manu-
... was made in and around
... what per cent? Just a rough
...uld be very small; I could not say. Those yards
...e closed most of the year. I am sorry I can not give
...ate information; possibly 1,000,000 cubic centimeters, or a
...le over.

The CHAIRMAN. All right, Dr. Dorset, we are very much obliged to you for your statement.

STATEMENT OF DR. A. D. MELVIN, CHIEF OF THE BUREAU OF ANIMAL INDUSTRY—Continued.

The CHAIRMAN. Dr. Melvin, will you take up item 61, on page 53, your meat-inspection item? There is no change in that, Dr. Melvin?

Dr. MELVIN. No; the only change was the transfer from the lump fund to statutory positions of a number of clerks, and a decrease accordingly in this amount.

Mr. MCDERMOTT. I would like to ask Dr. Melvin a question. Could you furnish me a statement as to how much rent you pay for quarters in Chicago, and how many square feet you need in Chicago—in the Union Stock Yards? Your offices there are located in four or five different places. Can you tell me how much rent you pay there?

Dr. MELVIN. No; I could not tell you offhand.

Mr. MCDERMOTT. Will you get me those figures and send them to me?

Dr. MELVIN. Certainly. We have, for instances, offices used exclusively for and paid for exclusively out of the meat-inspection appropriation. Then we have some other offices paid for out of the quarantine appropriation. Would you like each separately?

Mr. MCDERMOTT. I would want them separately and also in their entirety.

Dr. MELVIN. All right, sir.

Mr. HAWLEY. You have omitted, on page 44, item 60.

The CHAIRMAN. There are no changes there except by way of transfers.

Dr. MELVIN. Except by way of transfers; that is all.

The CHAIRMAN. Your automobile item, on page 215 of the Book of Estimates; I notice there that you are now using 19 automobiles

timeters. That would be 100 quarts, about, and the sample is drawn from that, so that it would be only a sample from each 100 quarts, or each 200 quarts, as the case might be, that would have to be tested.

Mr. McLAUGHLIN. I know a little of the way this serum is made or turned out by a private factory, but they are turning it out all the time, one batch after another.

Dr. DORSET. Yes, sir.

Mr. McLAUGHLIN. One batch to-day and another to-morrow, or one this week and another next week, and each batch may differ from any other batch; one may be good and another may not be good. Would you test each batch of itself?

Dr. DORSET. Each batch would be tested as an entity.

Mr. McLAUGHLIN. You might have to test the daily output of each one of those factories?

Dr. DORSET. We know that there were made by these factories 200,000,000 centimeters this year.

Mr. McLAUGHLIN. In how many different lots?

Dr. DORSET. I will tell you, about 2,000 batches. That would make 100,000 centimeters in each batch.

Mr. McLAUGHLIN. Is a batch so made that one test of it can be made to determine its purity and efficacy—if that is the proper word?

Dr. DORSET. It is all mixed in one large container, by continuous stirring, until a complete mixture is obtained.

Mr. HAWLEY. How many hogs would you use to make a test on with each batch?

Dr. DORSET. At present we employ about eight.

Mr. HAUGEN. That would be 16,000 hogs?

Dr. DORSET. Yes; about that.

Mr. HAWLEY. Could you use the same hog twice in a year?

Dr. DORSET. No, sir. You must remember, however, that a small part of these, the checking animals—the animals that are not given any serum, but are used as controls in the test—would probably die in many cases, and, of course, be thereafter valueless; but the ones we use to get the serum would generally survive and would be more valuable than the ordinary hogs, because they would be immune, so that you would not have to pay the cost of 16,000 hogs to make the test.

Mr. HAWLEY. How many would you lose in a year?

Dr. DORSET. It would depend on how good the serum was.

Mr. HAWLEY. I mean of the check animals?

Dr. DORSET. Probably about 4,000. And their carcases, of course in a well-run station, would be used for the production of fertilizers and grease; small shoats, they are.

Mr. McLAUGHLIN. Then, your idea is to have a law passed forbidding the shipment in interstate commerce of any of this serum made by private interests until it has been inspected and only after the affixing and canceling of a stamp that the Government would provide?

Dr. DORSET. Yes.

Mr. McLAUGHLIN. Now, those regulations could not be embodied in the appropriation bill, of course; that would have to be a special act of Congress, would it not; that would be new legislation?

Mr. HAUGEN. New legislation.

Mr. MCLAUGHLIN. And we could not put that in an appropriation act?

Mr. RUBEY. You could, but it would be subject to a point of order.

Mr. HAWLEY. Yes. Dr. Dorset, would you expect to raise your own hogs or buy them?

Dr. DORSET. That is a matter we have not determined. We have thought it might be desirable to raise them ourselves.

Mr. HAUGEN. If you raised them yourselves, would it not be well to compensate the farmers for taking over the whole hog industry? [Laughter.] Would not that be in line with what was suggested here in regard to taking over the manufacturing plants?

Mr. MCLAUGHLIN. With only 16,000 hogs used?

Mr. MCDERMOTT. Of the 200,000,000 centimeters of serum manufactured commercially this year, how much was made in and around the Union Stock Yards of Chicago; what per cent? Just a rough guess.

Dr. DORSET. It would be very small; I could not say. Those yards at Chicago were closed most of the year. I am sorry I can not give you definite information; possibly 1,000,000 cubic centimeters, or a little over.

The CHAIRMAN. All right, Dr. Dorset, we are very much obliged to you for your statement.

STATEMENT OF DR. A. D. MELVIN, CHIEF OF THE BUREAU OF ANIMAL INDUSTRY—Continued.

The CHAIRMAN. Dr. Melvin, will you take up item 61, on page 53, your meat-inspection item? There is no change in that, Dr. Melvin?

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The CHAIRMAN. There are no changes there except by way of transfers.

Dr. MELVIN. Except by way of transfers; that is all.

The CHAIRMAN. Your automobile item, on page 215 of the Book of Estimates; I notice there that you are now using 19 automobiles

in the hog-cholera eradication work, at a total cost of $12,730. If this committee should conclude to discontinue that class of work, you would not have any further need for those machines, would you?

Dr. MELVIN. We would not need to have them provided for. We could use them in some other work to replace some others. For instance, if we have this test station, we might need some in connection with that; and Dr. Dorset informs me that the one at Ames is worn out, and one of these could be used there. There would be no need of reenacting this, but we could replace worn-out machines by these.

The CHAIRMAN. Gentlemen, that concludes the statement of the Bureau of Animal Industry, with the exception of the item on page 220 carrying the foot-and-mouth disease appropriation. I take it that the committee would prefer to take that up in the order in which it appears in the Book of Estimates. If that is agreeable to the committee, we will do so.

STATEMENT OF DR. M. DORSET, CHIEF OF THE BIOCHEMIC DIVISION, BUREAU OF ANIMAL INDUSTRY—Continued.

Mr. HAWLEY. I see that Dr. Melvin has some map on the wall. I wonder if he or Dr. Dorset had any observations to offer on that which ought to go on the record?

The CHAIRMAN. I take it that that is an explanation of what you have been doing in your eradication work, Dr. Dorset?

Dr. DORSET. County work; yes, sir.

The CHAIRMAN. If you have any remarks to offer on that, we will be glad to hear them.

Dr. DORSET. The upper of these diagrams [indicating] represents the conditions in the three counties in which we began work in 1913, Dallas County, Iowa; Montgomery County, Ind.; and Pettis County, Mo. We began work there on this county plan about the 1st of July, 1913; we have worked there continuously since.

The black columns indicate the number of hogs raised in those three counties combined. The red indicate the number of hogs that died from cholera in the three combined during the same period. As you will see in the year before we began work there were raised in the three counties combined 221,682 hogs, and the loss from hog cholera was 63,078; whereas in 1915, 389,173 were raised and 6,665 lost. As the number of hogs has increased, the amount of disease has decreased very perceptibly. Now, of course, it may be that all of this decrease has not been due to our work. We realize that there is a recrudescence of the disease occasionally, and then a dropping off. But we are quite sure that a large part of that decrease is due to our work, because in 1913 the hog cholera in the United States and in these States was more prevalent than it was in 1912; and yet we find in these counties a very much decreased loss, even with a half year's work in these three counties. The disease was very prevalent in all when we went in there.

This second diagram [indicating] is intended to show the effect of the serum. This blue column represents the total number of hogs in herds affected with hog cholera in these 15 counties. The yellow column indicates the number that would have died without any treatment: 85 per cent of the total. The red column indicates the number

hat actually died. Now, in 1913 it must be remembered that we were working in only three of these counties and that the other 12 counties were not worked in at all. Therefore, the slight difference between the actual loss and the calculated loss is due to the fact that we were only working in three counties.

Now, come to 1914. In 1914 we did not go to work in some of these 15 counties until rather late in the season, but we worked in all of them in 1914. But you will see here the tremenduous difference between the calculated loss, 85 per cent, if not treated, and the actual loss, 35½ per cent, after our work started. Of course, many of these hogs were in the last stages of the disease, and it was not possible to save them. It just shows what we did under practical conditions.

Getting down to 1915, when our men were more experienced and the farmers knew more about it, we find a still further reduction in the percentage lost in the sick herds. The actual total percentage lost in these herds was 28.6 per cent. That represented the total lost, and not the loss among those treated—total loss in the herds—and we did not treat all of those hogs, because some of them had died before we got there and some were too sick to treat.

Mr. OVERMYER. I think the record ought to show the difference between the infected herds in 1915 and in 1913.

Dr. DORSET. Do you think I should read that into the record?

Mr. OVERMYER. Have you the figures here?

Dr. DORSET. Yes, sir.

Mr. HAUGEN. You are now taking into consideration the number of hogs, the expense and the stunting of the hog or the loss in value of the hog because of this treatment?

Dr. DORSET. No; we are not taking that into consideration, because that does not exist in these herds. The hogs have not been stunted and have not been injured by the treatment. They have been very much benefited by it; and so we have not considered that.

Mr. HAUGEN. You claim that it does not stunt the hog?

Dr. DORSET. No, sir.

Mr. HAUGEN. You admit it does?

Dr. DORSET. No; I say it does not stunt the hog.

Mr. HAUGEN. I will not question your statement, but I know it to be a positive fact that in many instances it stunts the hog. It has stunted hogs inoculated in our section of the country. That has been our experience.

Dr. DORSET. I think it would be a very serious drawback to the treatment if it stunted the hogs. If it stunted the hogs I would not come here and talk about it as I have. I feel sure—in fact, I think I can say that I know—that, when properly applied, it does not stunt the hogs. We have herds of our own at Beltsville that were given the simultaneous, or so-called double treatment, against hog cholera. The animal-husbandry man in charge of those hogs told me that they did not lose a feed; that he did not think those hogs were injured in the least, and that they were not thrown back in development at all. There were 50 or 100 of those hogs treated at one time, and they never lost a day's feed. It is not necessary to make them sick to immunize them. That is a mistake veterinarians sometimes make; they make them sick when it is not necessary.

Now, without taking more time, I will furnish those figures that you asked for, Mr. Overmyer, so that they may be inserted in the record.

Mr. OVERMYER. Yes; I will be glad to have them shown in the record.

(The statement referred to follows:)

Statement showing 3-year record of production of hogs in 14 counties, with special reference to hog-cholera control.

Year.	Number of outbreaks of cholera.	Number of hogs raised.	Number of hogs died.	Number of hogs died per 10,000.
1913	(1)	1,053,408	179,225	[illegible]
1914	4,735	1,144,926	65,287	[illegible]
1915	2,097	1,298,461	29,500	[illegible]

[1] No figures available.

(Thereupon, at 12.30 o'clock p. m., the committee took a recess until Thursday, January 20, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Saturday, February 5, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. Gentlemen, as I explained to the committee yesterday afternoon, I had a very interesting interview yesterday with Dr. Duval, of the University of Tulane, in reference to a hog-cholera vaccine which he has discovered and which he claims to be an absolute preventive of hog cholera.

Dr. Duval was introduced to me by Senator Broussard.

I understand that on yesterday morning Dr. Duval and Senator Broussard had an interview with Secretary of Agriculture Houston, and several gentlemen of the Bureau of Animal Industry in regard to this matter, and that it was agreed there that a test of this vaccine would be made at Ames, Iowa, this spring, probably in April.

I thought the matter was of such importance that we ought to hear from Dr. Duval personally, and therefore I called this meeting this morning.

I would like to say that this meeting is in no sense a criticism of anything that has been done in the department but that it is simply called that we might have a statement from Dr. Duval in regard to this matter.

I would like Senator Broussard to present Dr. Duval, and tell us in what institutions he has served and what his educational qualifications are.

STATEMENT OF HON. ROBERT F. BROUSSARD, UNITED STATES SENATOR FROM LOUISIANA.

Senator BROUSSARD. Mr. Chairman and gentlemen of the committee, Dr. Duval will probably be able to tell you more about his work as a scientific man than I can. I can say this, that he is looked upon, not only in our section of the country, but throughout the scientific world, as the foremost man in his line of scientific investigation. He is now pathologist in the University of Tulane, as well as in the charity hospital at New Orleans. He has done considerable work at Harvard University and he has done work under Dr. Flexner. In addition to that, in the course of his investigations he has done work with Dr. Welch, of Johns Hopkins University in Baltimore, and with various other scientific investigators of the highest standing.

He came to this city a few days ago and wanted to have an interview with the Secretary of Agriculture in regard to his discovery of a new method of treating hogs and immuning them from cholera, with view of meeting the requirements of the law in regard to license.

After we had discussed the matter with Secretary Houston he became so intensely interested that he said to Dr. Duval if he had no objection he would send for Dr. Dorset and Dr. Melvin. These two gentlemen came, and the whole matter was discussed for considerably over two hours.

The result of that talk was that the Secretary thought there should be an investigation of the matter, with a view of testing the claims being advanced by Dr. Duval, and it was finally concluded that tests should be made at some station of the Government in the Middle West during the spring.

Knowing that Mr. Lever was interested in the question, I took the liberty of bringing Dr. Duval to him yesterday, and presented him to Mr. Lever. Mr. Lever sent for Mr. Haugen and Mr. Steele, and also for other gentlemen, whom we could not reach, and the whole matter was discussed with Dr. Duval. Subsequently Mr. Lever asked Dr. Duval if he would talk to your committee about the matter. Dr. Duval said he would be glad to delay his departure from the city in order to appear before the committee this morning.

Of course, we look upon Dr. Duval as a leading authority along the lines of his profession, and we think his statement in connection with the matter is the most authentic statement that could be made. But I do not need to give you that assurance, because I am very sure after you have heard him you will be convinced of his knowledge of the question which he will discuss.

STATEMENT OF DR. CHARLES W. DUVAL, OF NEW ORLEANS, LA.

The CHAIRMAN. Doctor, I wish you would give us your full name, tell us what your professional education has been, and describe your scientific qualifications.

Dr. DUVAL. My name is Charles W. Duval. I graduated in medicine from the University of Pennsylvania in 1903. After graduation I did investigative work with Prof. Flexner, who is now director of the Rockefeller Institute in New York.

The CHAIRMAN. How many years did you work with him?

Dr. DUVAL. Three years. From New York I went to Boston, where I worked with Profs. Councilman and Mallory, of Harvard University, for three years.

From there I was called to McGill University at Montreal, in which institution I taught pathology and bacteriology.

The CHAIRMAN. How long were you there?

Dr. DUVAL. I was there three years. From McGill University in Montreal I was called to the chair of pathology and bacteriology in Tulane University in New Orleans, where I have been for the past six years.

I have been working in the laboratory field of medicine ever since I graduated; as a matter of fact, before I graduated.

Since graduating in medicine I have published a number of scientific articles upon the infectious diseases of man, such as tuberculosis, glanders, acute and chronic dysenteries, leprosy, and others. For the past year I have been interested in studies upon hog cholera; I would like to state to the committee here that I have, with my coworkers, discovered a new specific prevention of hog cholera,

is no longer in the experimental stage, but in my opinion an
shed fact. The results of this work were presented in Boston
Christmas week at the meeting of the American Association
erimental Pathologists.
re describing this new specific preventive for hog cholera, per-
to say that the treatment of hog cholera at the present time
eans of a hyperimmune serum, or antitoxin analogous to the
n of diphtheria, which if not used in conjunction with the
ccmplishes at best an immunity of 8 or 10 weeks' duration.
cLAUGHLIN. Do you mean yours?
ɔVAL. No; I refer to the old method which is preventive and
re, and it is an immunity that lasts at best only a few weeks.
another method in which the farmer has to inject simul-
y the living virus of hog cholera, with the serum. This
s dangerous.
this new specific preventive that we have, which is in the
f a vaccine, we can protect the hogs permanently without
ger to the hogs injected or those associated with them.
accine is prepared from the virus of hog cholera. As you
know, the virus of hog cholera—the germ, if you please—
r been cultivated outside of the animal tissue. This specific
virus passes through the finest filters, and as it has not been
oscopically, we designate it an ultramicroscopic filter passer.
rus which is in the hog's blood, and in the organs of the hog,
in such a way as to alter its infectivity without destroying
tive property and through the administration of this altered
nunity is conferred without infecting the hog.
well-known fact that the power of a virus to multiply or, in
rds, its viability, may be destroyed without altering its
s property.
his new method of ours we destroy the viability of the
there is no danger of infecting the animal. Therefore
o the hogs a material that is incapable of causing the disease,
y efficacious in producing protection against subsequent in-
om cholera.
mmunity is the same immunity that the hog acquires in the
the natural disease if he recovers. We say it is permanent
e know that in the natural disease a hog that recovers can
fected with hog cholera again. It is a permanent immunity
me sense that smallpox is a permanent immunity. It is a
n against subsequent invasion by the specific germ and is
bout in this way: The poison of the germ stimulates or acts
cells of the animal body. These cells, reacting, produce
s that are antagonistic to the germ and its poison.
soon as enough of the antagonistic substance is developed
he germ and its poison gotten rid of, and the hog recovers.
as this antagonistic substance remains in the animal body,
ng will the animal remain immune against a subsequent
the disease. In hog cholera the protection is permanent,
llpox.
ie infections the specific substance does not remain; its
s of shorter duration, as in the case of grippe or influenza.
aterial or product which we have for the prevention of hog
s in the nature of a vaccine. The virus is treated in such a

way as to alter the infectivity—that is, to destroy the virility (germ without destroying the substance which establishes immu

We take the substance and either vaccinate or inject it into th and no symptoms of hog cholera will arise. You can not observ sickness in the hog, and in from three to four weeks a hog is prot It does not do to subject the hog to hog cholera during the time establishing an immunity, but after two or three weeks you car ject the hog to many times the fatal dose of virulence of hog-cl virus, either by experimental injection or by placing the hog those ill of the disease, and it will not contract cholera.

This substance is very easy to produce, and it is inexpe For a dime or so it can be put to the farmer, and it does away syringes and antitoxins and things of that sort in the use of the farmer has to become experienced before he can properly h them.

I have here a vial of the material. It is a powder that is not tive but highly protective, and there is enough in this little v immunize half a million hogs.

I would be glad to answer any questions.

Mr. STEELE. What is your proposition?

Dr. DUVAL. I came here to get the Department of Agricultu test out this method in order to see whether the claims are corr

Mr. HAWLEY. Do you intend to patent the serum or retain it trade secret?

Dr. DUVAL. A paper describing this method is now read the press, and will appear in April or May in some one of the l cal periodicals.

Mr. HAWLEY. No one will be able to patent it and retain it trade secret?

Dr. DUVAL. No; I would not think of doing anything of the because I am jealous of the little reputation I have in the scie medical world. I thought a long time about the matter, as to wh it was ethical or not. If it had anything to do with the treat and cure of ailments of the human race I would consider it une to patent.

Mr. HAWLEY. You are contributing this to the good of the c

Dr. DUVAL. We are going to patent it, but it is not to be k secret. The formula will be published. It is as follows:

We dry the blood and organs of a hog in a vacuum over sulp acid, and the dried material, if kept at zero degrees centigrad maintain its infectivity almost indefinitely; we know it will l it for more than a year.

By taking the dry powder away from zero degrees centigrad raising the temperature for a period of weeks we get to a point the infectivity is destroyed and its power to immunize rete That is the whole process, and I may say the destruction of tivity of a virus is nothing new in medical science.

It is simply attenuating the germs and separating their p and then altering the poison so that it will not give rise to symp There is nothing new about that at all. It is a combinati scientific principles.

The CHAIRMAN. What practical tests have you put this to?

Dr. DUVAL. We have used about 200 animals, and have neve a case.

Mr. RUBEY. What is the value of this material you have in this vial?

Dr. DUVAL. Little or no intrinsic value, as it costs practically nothing to produce. We take the organs of one hog and grind them up with the blood and get rid of all the moisture, and the resulting residue or powder will immunize a million hogs. So that you can arrive at the cost of that by figuring out the cost of the hog and its keep and the cost of a little apparatus necessary to dry and attenuate, and you will be able to get the actual cost.

Mr. STEELE. You say the department is going to have this test made at Ames? This is a very interesting case.

Why would it not be better to have several investigations made at different agricultural schools and colleges where they are making hog serum; at three or four of them?

Dr. DUVAL. I am open to suggestions. I am simply here to get this product tested out by the Agricultural Department. Whatever the Agricultural Department decides to do in the matter would be perfectly agreeable to me. I think tests could be made at the different agricultural stations. I would like one of the experiments carried on here near Washington, where the Secretary of Agriculture and the gentlemen who have heard me this morning could actually see the field demonstrations. It is certainly ideal to have this carried on simultaneously in different parts of the United States, say, in Massachusetts, and perhaps in Florida, Iowa, Washington, or wherever there are agricultural stations.

Mr. STEELE. South Dakota has a good experimental station in connection with hog cholera at Mitchell.

Dr. DUVAL. I would like to get this tested by the department somewhere in the near future, because I know we have here a specific proposition. It is not a cure of cholera.

Mr. HAUGEN. What is to be gained by carrying on an investigation at various points?

Dr. DUVAL. There is really nothing to be gained by it.

Mr. STEELE. It will demonstrate to us that you have a cure, and in doing that it ought to be experimented upon pretty thoroughly, if we are going to reverse our entire method of eradicating hog cholera. We are spending hundreds of thousands of dollars for the eradication of hog cholera. If you have a scheme by which that can be done more economically, and not scatter the disease, it seems to me that that is a very important subject, and a matter that should be thoroughly demonstrated under your supervision, to us. You would suggest, as I understand it, to have that experiment made as rapidly as possible. The Agricultural Department, through their method of eradicating hog cholera, is working out a scheme whereby they want to take charge of these several plants that are now manufacturing that substance, and are thinking of making large appropriations for that purpose, and so it seems to me that in two or three months you ought to be able to establish to the Department of Agriculture and to every one else interested that you have a remedy. That is the way I understand it.

Mr. HAUGEN. How long would it take to give this a thorough test?

Mr. DUVAL. It is a matter of a very few hours to vaccinate the hogs. Say we had 25 hogs in this room, it would not take very long to scratch back of their ears and rub the vaccine material in. Then

we must wait three or four weeks before subjecting the hogs to the living virus.

Mr. HAUGEN. How much time would be required after the three or four weeks?

Dr. DUVAL. The hogs take the disease, depending of course on the virulence of the virus, in from 3 to 15 days.

Mr. HAUGEN. It could be tried out in less than two months and thoroughly tested?

Dr. DUVAL. Yes; six weeks is all the time necessary. If we allow three weeks after vaccination, and then subject the hogs to cholera or inject the hogs with many times the strength of a fatal dose of the virus, inside of a month, it seems to me, you would have a demonstration.

Mr. HAUGEN. What is to be gained by carrying on the experiment in the various sections of the country?

Dr. DUVAL. I do not know that there is anything to be gained.

Mr. HAUGEN. Is it not fair to assume that if your remedy would protect a hog in Washington it would do so in any other place?

Dr. DUVAL. Yes.

Mr. ANDERSON. Can you say what the effect of the virus is upon the food value of the hog?

Dr. DUVAL. It has no effect on that at all. Hog-cholera virus can not possibly infect man, nor will it infect any other animal. You can eat the meat filled with the virus of hog cholera and it would not hurt you.

Mr. ANDERSON. I want to ask you whether or not this process would result in reducing the vitality of the hog, or decreasing its ability to grow?

Dr. DUVAL. No.

Mr. LEE. You have not experimented on the cost of vaccinating—how much it would cost to vaccinate the hog and give the demonstrator or the surgeon a reasonable profit per head on the hogs?

Dr. DUVAL. I have not even thought about that. I only know that the manufacturing cost of this is almost nil.

Mr. LEE. It costs from 25 cents to 75 cents a hog now?

Dr. DUVAL. That is what the serum costs to-day. In producing any antitoxin it is expensive. In the production of antitoxin you are obliged to use animals. In the case of diphtheria we use horses; infecting the horses with small doses, and in the course of three months the blood of the horse is charged with enormous quantities of protective substance which we call antitoxin. Then the blood of the horse is withdrawn and standardized and put up in vials and injected into the human species that have diphtheria, or whom we wish to protect against diphtheria.

In the case of hog cholera, we can not use the horse, because this animal is not susceptible.

In the production of antitoxin we must use susceptible animals. If we do not, there is no response. So, in the case of hog cholera we are obliged to use the hog. It means the use of a great many hogs to get this hyperimmune serum. Again, in keeping the virus in the laboratories, it has to be passed into the hog every six or eight weeks. With this method we have you can dry the virus and keep it at zero degrees centigrades for years, just as we do the rabies virus. But in the moist state it dies out in six or eight weeks.

So, a laboratory man, in order to keep the virus going, that he may have a supply for the different stations, must put that blood containing the virus into a hog every six or eight weeks. Now, by this new method we can preserve the infectivity of hog-cholera virus indefinitely.

Mr. WILSON. You say you have enough in that little vial to treat half a million hogs?

Dr. DUVAL. Yes.

Mr. WILSON. Now, what do you do with that in order to treat so many hogs?

Dr. DUVAL. We weigh it out.

Mr. WILSON. Do you mix it with water?

Dr. DUVAL. Yes; the powder may be suspended in a little sterile water and put into a syringe and injected, or the powder may be mixed with some solvent, like glycerin, which allows it to adhere to some pointed instrument, such as a vaccine point, so that when you scratch the hog back of the ear with it this material held on the point is rubbed in.

Mr. STEELE. Then I can do it just as well as you can?

Dr. DUVAL. Anybody can do it.

Mr. STEELE. As a farmer I am trying to get away from these veterinarians.

Dr. DUVAL. You can get away from them.

Mr. OVERMYER. I have heard of cases where a farmer would take a hog and cut him up and feed him to the remaining well hogs and claim they are immune.

Dr. DUVAL. That is possible if the hog had the disease in a very mild form, and he gave to each hog a small quantity of the infected meat. He would establish the disease in the other hogs in a mild form, resulting in immunity; but it is a very dangerous procedure.

Mr. HAWLEY. How long would that immunity last?

Dr. DUVAL. It would last for the natural life of the hog; but where that might be done successfully once it would fail a thousand times, because the virus is extremely virulent.

Mr. REILLY. As I understand it, you have made arrangements with the Department of Agriculture to make this test at Ames, Iowa, some time this spring. After that is done if they are convinced of your claim, what will be the next step to be taken?

Dr. DUVAL. I do not know as yet.

The CHAIRMAN. There would not be anything necessary, except for you to begin manufacturing, and if the department issues you a license to ship the stuff in interstate commerce, then you could go ahead.

Senator BROUSSARD. We have gone to the Secretary, Mr. Chairman, with a view of complying with the law requiring a license before manufacturing and selling this stuff. That brought about the question of experimentation. Of course, the Agricultural Department wanted to establish the fact advanced by Dr. Duval before issuing a license for the manufacture of the stuff.

Mr. OVERMYER. I do not see why we should wait until April to make the experiments. It seems to be a simple experiment, and I do not see why we should wait that long.

Dr. DUVAL. In that connection I may say that Dr. Dorset stated that perhaps it would be better to wait until warm weather before

making these tests; that the hogs in cold weather were not suitable for experimentation. I did not say anything at that time, but I do not mind saying here that the cold weather or the hot weather makes not a bit of difference. The temperature of the hog, like the temperature of human beings, if they are normal, remains the same, winter and summer. We have a normal temperature of 38½° C. or 98.2° F. As the outside temperature changes, we have our regulating centers that keep it uniform. The same thing applies to the hog. So the matter of weather plays no part.

Mr. OVERMYER. It seems to me if this is a preventive that actually will do what you claim for it, it would be criminal to delay the application of it two months.

The CHAIRMAN. Those gentlemen who were present yesterday evening discussed this matter informally, and it was the judgment of those present that the Secretary of Agriculture should make his investigation at a point near Washington at the earliest possible day.

Mr. Harrison, the private secretary of the Secretary of Agriculture, was present, and he understands the viewpoint of the members of the committee in that regard. He informed me this morning that he has not had an opportunity to talk with the Secretary in regard to the matter since our meeting yesterday evening.

Mr. OVERMYER. When these tests are made, they want to be made so that we will know what the results are.

The CHAIRMAN. I think it is safe to say, gentlemen, that the Secretary of Agriculture will not delay these tests. My own judgment is that the tests ought to be carried on under various environments.

Mr. HELGESEN. If there should be any question concerning the weather conditions, there is no difficulty in getting summer weather conditions in the South now. It seems to me if you had experiments made in different sections of the country, it would help to establish confidence among the people more rapidly.

The CHAIRMAN. That is my view.

Dr. DUVAL. If I may be permitted, I should say that the experiments should be carried on at the same time, and for this reason: We have along the Atlantic seaboard what might be regarded as the chronic form of hog cholera, while in the Middle West or in some other place we have it occurring in the form of epidemics, and in the very acute form.

Dr. Dorset brought that point up. He thought that by carrying on the experiment in Iowa, where the disease was acute, it would be a better test of the effect of the prevention or treatment than if the experiment was carried on where the disease is chronic.

I think for the laity it would, perhaps, be best to make tests simultaneously in localities where hogs have the disease chronically and acutely.

Mr. REILLY. A number of experiments would give confidence in the effect of this method; is that not true?

Dr. DUVAL. If I understand you, you mean if the experiments are carried on in different places.

Mr. REILLY. In half a dozen different places?

Dr. DUVAL. It would reach more people at the same time than just carrying it out at one place.

Mr. WILSON. There would be no large expense?

Dr. DUVAL. There is no loss in hogs except in the case of the controls.

Mr. MCLAUGHLIN. It would be advisable, would it not, to carry out the experiments where the different types of the disease prevail, wherever there are different types of infected matter?

Dr. DUVAL. Yes. The test could be carried out in this way. Take 50 normal hogs, and divide into three separated groups, 40, 10, 5, respectively, vaccinate the 40 group, inject with living virus the 10 group, and keep as normal controls the 5 group.

After three or four weeks we would take the vaccinated hogs and put them with the hogs that are ill with cholera, in order to see whether they will contract the disease. Our normal hogs we would also put with those dying with the disease. The normal hogs will contract the disease, while the vaccinated hogs will not do so under any circumstances.

Mr. STEELE. Would it be possible for you to go to Sioux City or Omaha, where this hog cholera is very prevalent, and where they ship carloads of cholera hogs into the market, and take the Government forces there, and establish to the veterinarian the dependability of the vaccine?

Dr. DUVAL. It is quite easy to do it anywhere.

Mr. STEELE. Would it be possible to get the cholera hogs at Ames, Iowa?

Dr. DUVAL. You can get them anywhere by simply injecting them with the virus.

Mr. HAUGEN. Could it not be done to better advantage by assembling the hogs here?

Dr. DUVAL. I should think it would be much better to have the main test carried on here at Washington where the Secretary and those who are directly interested could see the test.

Mr. HAUGEN. If it was found necessary, it could be done in other places, but as a matter of experiment it can be tested out better here in Washington, under the scrutiny of the highest authorities we have than to make such a test at some other place.

Dr. DUVAL. You see the sick and well hog, and you observe certain sharp-cut results.

Mr. STEELE. The point I have in view is this: If we could get this experiment made before Congress adjourned, it would be very profitable to the Government, because we would not have to appropriate a lot of money for certain things that we think ought to be had to govern the manufacture of serum.

Dr. DUVAL. Yes, sir.

Mr. STEELE. So, this committee would like to know, I imagine, whether it is a good proposition, and if it is, then we can go ahead with it.

Dr. DUVAL. I do not hestitate in saying that when this vaccine is introduced and used we will not bother any longer with hyperimmune serum.

Mr. REILLY. Why don't you go on and manufacture it right away and send a supply of it to the State institutions?

Dr. DUVAL. You have to have a permit, as I understand it, from the Agricultural Department.

Mr. HAUGEN. Have you applied for a license?

Dr. DUVAL. After talking with the Secretary the other day we applied for a patent. We have not applied for a license.

Mr. HELGESEN. Do I understand that this is a cure?

Dr. DUVAL. Just a preventive, like in the case of vaccination against smallpox.

Mr. HELGESEN. Just a prevention?

Dr. DUVAL. Yes, sir.

Mr. REILLY. Can't you use that with a pig 3 or 4 weeks old—immunize them for all time?

Dr. DUVAL. Yes, sir; the animals we have been using it on range from 15 to 200 pounds.

Mr. LEE. Are there any evil effects on the hogs?

Dr. DUVAL. No, sir.

Mr. HELGESEN. If you have absolute confidence in this preventive, while you may not be able to sell it without a license, you could go on manufacturing it. If that bottle which you have in your hands contains enough vaccine to take care of 2,000,000 hogs, it would not take much to manufacture enough to take care of all the hogs in the country. Could you not go ahead with the manufacture of it?

Dr. DUVAL. I would venture to say that we have enough in the laboratory to immunize every hog in the United States—90,000,000 hogs.

The CHAIRMAN. Are there any further questions?

Mr. MCLAUGHLIN. How do you separate it? You have the little vial there which you say contains enough to immunize 500,000 hogs. How do you separate it and get at the individual doses?

Dr. DUVAL. We weigh it out.

Mr. MCLAUGHLIN. You say there is enough there to treat half a million hogs?

Dr. DUVAL. Yes, sir; there are a great many grams here.

Mr. MCLAUGHLIN. You can not divide that into very many parts.

Dr. DUVAL. Yes, sir; we can weigh that out into, for instance, doses of one two-hundredth part of a milligram.

Mr. HELGESEN. If that will immunize a half a million hogs, the quantity necessary for 25 hogs would be so small you could not see it.

Dr. DUVAL. It is mixed in a menstrum.

Mr. HELGESEN. If the dose varies, will it make much difference?

Dr. DUVAL. No; large doses do not act detrimentally.

Mr. HELGESEN. How much vaccine is obtained from one hog carcass—250 pounds?

Dr. DUVAL. I could not say with certainty. However, such a hog should yield enough to immunize many thousands. Of course, I do not use the skin or bones or ligaments—just soft tissues.

Mr. MCLAUGHLIN. When was this brought to the attention of the Bureau of Animal Industry?

Dr. DUVAL. After my return from Boston in the latter part of December, where I read a paper before the American Society of Experimental Pathologists, I received a communication from the Bureau of Animal Industry signed by William N. Berg. He stated in his letter that he would like to receive a copy of my paper on the desiccation of hog-cholera virus.

The CHAIRMAN. Is that gentleman from the Department of Agriculture?

Dr. DUVAL. The Bureau of Animal Industry.

The CHAIRMAN. Is that the Department of Agriculture in Washington? Where is the letter dated?

Dr. DUVAL. Washington, D. C., January 4, 1916.

Mr. MCLAUGHLIN. Then, these gentlemen knew about it when they appeared before our committee some weeks ago?

Dr. DUVAL. In view of the letter written by Mr. Berg, I should think so.

The CHAIRMAN. Did you comply with the request for a copy of the paper?

Dr. DUVAL. No, sir; it is not published.

The CHAIRMAN. Then, as a matter of fact, it is not now in the hands of the department?

Dr. DUVAL. No, sir; but I told them about it. It was last Tuesday when I saw the department people.

The CHAIRMAN. Will you kindly let me see that letter?

Dr. DUVAL. Yes, sir.

Mr. STEELE. You say you will patent this to protect the manufacturer of it or the absolute sale of it?

Mr. REILLY. Both.

Dr. DUVAL. I may say, in this connection, that I am a salaried man, a professor at one of the universities, and, like all professors in my line, I do not get a great deal of salary. Four or five thousand dollars is the best paid to pathologists in the United States. At our medical school we have trouble in getting enough money to carry on research, and I had thought, when this discovery was first made, that, inasmuch as it did not pertain to man, and therefore not unethical, it could be patented.

By so doing we could realize something for ourselves and for the school we are connected with. I might say that for several years we have been trying to get money for investigations of one sort or another from people like the Rockefeller and Carnegie foundations. Occasionally we do get small grants of money to defray expenses of such investigations. In this particular investigation I did not get a grant from these people, but defrayed the expenses out of my own pocket and out of the pockets of my friends. We have bought these hogs at from 5½ to 6 cents a pound. I thought I saw in this vaccine a means of realizing something on it. It would cost the farmer a very small figure—say 10 or 15 cents. He gets absolute protection from it. Anybody can apply it. On the other hand, the hyperimmune serum used to-day costs anywhere from 30 to 75 cents a dose, and sometimes several doses are necessary, and the farmer dare not use it except where hog cholera has broken out in his herd, for fear of spreading the disease.

Mr. STEELE. The thought I have is that after we had destroyed the manufacture of serum, that the price of your product would be so high——

Dr. DUVAL (interposing). I do not think that would ever be thought of, for the simple reason there are millions of hogs in the United States, and it would be very much more profitable to vaccinate every hog at a price of 10 or 15 cents a dose than to charge a higher price which would surely prohibit its general use.

Mr. STEELE. I am in favor of having the Agricultural Department take this matter up right at once and investigate it to their entire satisfaction and report on it.

The CHAIRMAN. That is a matter we will discuss later.

Mr. MCLAUGHLIN. Will the investigation you speak of involve your employment with the department—your active work?

Dr. DUVAL. As I am interested, there would be no need of employing me. I would be only too glad—and in fact anxious—to come on here and make tests or go wherever the department thought the tests should be made.

The CHAIRMAN. How long has it been since you discovered this remedy?

Dr. DUVAL. The work began in January a year ago. In June and July of last year we determined a dose that was applicable to hogs of all weights.

The CHAIRMAN. When did you begin to make practical tests on the hogs?

Dr. DUVAL. Last April.

The CHAIRMAN. And you say you have not lost one?

Dr. DUVAL. None with the finished product. You will understand that, in the course of experimentation, animals are lost. Of necessity a number of animals are sacrificed in the trials.

Mr. RUBEY. Suppose you had experiments conducted in Washington, Illinois, and two or three Northwestern States all at once, and all the reports came right back to Washington. Would not that be more satisfactory to you and to anyone else—to have the reports from all parts of the United States?

Dr. DUVAL. Oh, yes.

Mr. HELGESEN. How many hogs have you tested since you got it perfected?

Dr. DUVAL. I could not tell the exact number, but somewhere over 50, because in the whole list of experiments since last July we have used about 200 hogs.

The CHAIRMAN. We are very much obliged to you, Senator Broussard, and to you, Dr. Duval. The committee will remain in session for a few minutes.

(Whereupon, at 11.15 o'clock a. m., the committee went into executive session.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Thursday, January 20, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. The committee will come to order. Gentlemen, turn to page 55 of your Book of Estimates, and we will take up this morning the Bureau of Plant Industry.

STATEMENT OF DR. WILLIAM A. TAYLOR, CHIEF OF THE BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. We will ask Dr. Taylor to help us with his statutory roll. The first change I see is item 7, "1 executive clerk, $2,250, transferred to statutory roll of the Secretary's office."

Dr. TAYLOR. That is a transfer of a statutory place from the Bureau of Plant Industry to the Secretary's office.

The CHAIRMAN. Your roll has been reduced that amount?

Dr. TAYLOR. Yes, sir; that transfers the money.

The CHAIRMAN. Your next is, "2 executive clerks, at $1,980 each (decrease of 1 by transfer to statutory roll of Secretary's office)." Is that a transfer to the statutory roll?

Dr. TAYLOR. Yes, sir; that is of the same nature; from the Bureau of Plant Industry to the Secretary's office.

The CHAIRMAN. And likewise a reduction in your own roll?

Dr. TAYLOR. Yes, sir.

The CHAIRMAN. The next is item 17, "3 clerks, at $1,500 each (increase of 1 in lieu of 2 clerks, at $840 each, with decrease of $180)." The note reads:

> This change will result in a saving of $180 and will enable the bureau to secure the services of a high-grade clerk by dispensing with two low-grade employees. It is difficult to get experienced clerks at $840.

Do those two clerks go out of the service, or do you provide for them elsewhere?

Dr. TAYLOR. Those are vacancies, or will be at the end of the fiscal year. This is a conversion of two $840 clerks to one $1,500 clerk, for more effective use of funds provided.

The CHAIRMAN. The next is item 18, "20 clerks, class 2 (decrease of 1 by change to 1 clerk or artist at $1,400, as below)." Why do you make that change, doctor?

Dr. TAYLOR. That is a change of designation to conform more nearly to the character of work done. The individual involved is an

artist and is in that class or position by permission of the Civil Service Commission, but it is the desire of the commission that the designation shall conform to the character of work performed.

The CHAIRMAN. At the request of the Civil Service Commission?

Dr. TAYLOR. Yes, sir: that conforms to their request.

Mr. HAWLEY. He goes in again at item 33?

Dr. TAYLOR. Yes, sir.

The CHAIRMAN. Now, doctor, item 26, "19 clerks, at $840 each (decrease of 2 by change to 1 clerk at $1,500, as above)." That change has already been taken care of, has it not?

Dr. TAYLOR. Those are the two previously mentioned.

The CHAIRMAN. What do these $840 clerks do?

Dr. TAYLOR. General clerical work—in part clerical and in part stenographic, depending upon the particular work in the bureau to which they are assigned and where their services are needed. But I may say, Mr. Chairman, that our experience is that it is difficult to retain competent people in these lower-paid clerical places, and that we therefore are continually changing the individuals in those places. It is therefore preferable to carry these frequently changing employees to the extent that they are needed, as temporary employees on lump sums, as long as they are necessary, and that is usually three months.

The CHAIRMAN. Item 29, "41 messengers or laborers, at $720 each, decrease of 1 by transfer to statutory roll of Secretary's office." There seems to be a decrease of one there by transfer to the statutory roll of the Secretary's office?

Dr. TAYLOR. That is a transfer of money and position to the Secretary's roll.

The CHAIRMAN. Your next change is item 40, "1 laboratory aid, clerk, or skilled laborer, in lieu of 1 laboratory aid or clerk, at $1,080." That is a change of designation?

Dr. TAYLOR. That is a broadening of the designation in order that the position may be available for either of the three classes of service. We have in the next item a similar suggestion.

The CHAIRMAN. Item 42?

Dr. TAYLOR. That is done so that the place may be used either for laboratory aid, clerk, or skilled laborer, as the changing needs of the work may require.

Mr. HAWLEY. Does it mean that one person can do the work in each of these three classes?

Dr. TAYLOR. No, sir; it means that the person who fills it at any time will be an aid or clerk or skilled laborer.

The CHAIRMAN. He can do either of the three things?

Dr. TAYLOR. He can not do all three but can do either one. In other words, we can use this position for either one of those three types of work.

The CHAIRMAN. You place it that way to give you a little elasticity?

Dr. TAYLOR. Yes, sir.

The CHAIRMAN. The next item is item 42, "3 laboratory aids, at $960 each, in lieu of 4 laboratory aids, at $600 each and 1 laboratory aid at $720 omitted, with total decrease of $240."

Dr. TAYLOR. That is a conversion of four $600 laboratory aids and one at $720 into three $960 laboratory-aid places. We have

it practically impossible to retain at the lower salaries, for
of the character that these aids do, the type of experience and
cy that is required.

HAWLEY. Will the three men that you are putting on there
e to do the work that the others heretofore have done?

TAYLOR. We feel they will do more work, because they will
capacity for doing work of a higher type. They will have
xperience and better efficiency.

HAUGEN. You expect to retain the same people?

TAYLOR. I will say, Mr. Haugen, in these $600 places there
en a continuous procession of people through these places. We
t them at $600, and they get a few months' experience and
o to places outside of the Bureau of Plant Industry—to the
u of Standards, for instance—at higher salaries.

CHAIRMAN. Doctor, take up item 45; that is explained by item
elieve?

TAYLOR. Yes, sir.

CHAIRMAN. What do these laboratory aids do?

TAYLOR. They assist in routine scientific work under the direc-
f investigators, and in some cases eventually develop into the
igational type of worker.

CHAIRMAN. They are really laboratory helpers?

TAYLOR. In a way they are helpers. We use the word "helper"
er a person who merely does what he is told. These laboratory
o more than that. They act as real assistants, within the range
ir capacity and experience.

CHAIRMAN. I see.

TAYLOR. They are above the grade of helper, as we use that

HAUGEN. They are young men who have recently graduated
college?

TAYLOR. From colleges or technical high schools. In the $600
, of course, we can not reach the college men.

HAUGEN. It is a sort of post-graduate course, is it not?

TAYLOR. In a way; yes, sir.

LESHER. They all come under the civil service, do they?

TAYLOR. Yes, sir; they are all appointed from the eligible lists.

HAUGEN. Under the present arrangement it is not possible to
re of them?

TAYLOR. No, sir.

CHAIRMAN. In item 46, page 57, I find "1 laboratory appren-
How does he differ from the men we have been talking about;
loes he do? I was just wondering if this place could not be
ed with one of these other items here. These various designa-
et the committee in considerable trouble sometimes, for it is
ible for us to know just what you mean when somebody asks
stion. At times we are unable to answer.

TAYLOR. This laboratory apprentice was appointed from a dif-
register and is not transferable to a laboratory-aid position.

CHAIRMAN. The next item is 53, where you change the title of
chanician to one skilled laborer?

TAYLOR. That is the only promotion estimated for in the statutory
r. Chairman. The estimates provide for the dropping of this
-laborer position and for the provision of a mechanician at

the higher salary of $1,080. Fifty-eight is the item which is related to this.

Mr. HAWLEY. Is that a new place?

Dr. TAYLOR. No, sir; that is a proposed increase in salary of $120 for the man in our greenhouse work, who does all of our repair and modification work of the heating and similar equipment.

The CHAIRMAN. Is he carried now in the law as a mechanician?

Dr. TAYLOR. No, sir; as a skilled laborer.

The CHAIRMAN. You propose a new title?

Dr. TAYLOR. Yes, sir.

Mr. MCLAUGHLIN. That appears in item 58?

Dr. TAYLOR. Yes, sir; the man has rendered very efficient service at a compensation below that which his type of work is worth.

The CHAIRMAN. Let us see if I get that. In item 58, in your present law, you have two mechanicians?

Dr. TAYLOR. No, sir; this is merely a change of one skilled laborer in item 53 to one mechanician in item 58.

The CHAIRMAN. I see. You just change the title of one man and increase his salary by $120?

Dr. TAYLOR. Change the title of one and increase the salary, the title "mechanician" more accurately fitting the character of work the man does.

The CHAIRMAN. Do you think it is necessary, Doctor, to change that title?

Dr. TAYLOR. We thought it advisable, in that it more accurately indicates the type of work he is doing, though the position could be designated "skilled laborer, at $1,080."

Mr. HAWLEY. Has the character of work been somewhat changed from last year?

Dr. TAYLOR. No, sir.

The CHAIRMAN. These changes of titles get us into lots of trouble, Doctor. Take up your next item. No. 67, "2 laborers, or charwomen, at $480 each (decrease of 1 by change to 1 charwoman at $240)." What is that now?

Dr. TAYLOR. This involves the change of 2 laborers or charwomen at $360 each to 2 charwomen at $240 each. It has been found advisable to have the work done on a half-time basis—that is, a half-day rather than a full-day basis—to a large extent, and this represents that change.

Mr. MCLAUGHLIN. Those words in brackets "2 laborers or charwomen, at $360 each, change to 2 charwomen at $240 each, as below" means "above," does it not?

Dr. TAYLOR. That statement refers to item 69.

The CHAIRMAN. Sixty-nine would be explained as you have already explained 67 and 68?

Dr. TAYLOR. Yes, sir; 69 provides an increase of 4 charwomen at $240 each on the half-time basis, as explained in the note under 69.

The CHAIRMAN. All right, sir. That seems to amount to a reduction there. How much does it amount to, Doctor?

Dr. TAYLOR. A total decrease, in so far as item 69 is concerned, of $660.

The CHAIRMAN. $660?

Dr. TAYLOR. Yes, sir.

he CHAIRMAN. Doctor, item 72 is the general authority for the k of the Bureau of Plant Industry. There is no change in that, here?

r. TAYLOR. No change in the general language.

he CHAIRMAN. Item 73, "For investigations of plant diseases pathological collections." There is an increase in this item of 00. Now, Doctor, if you would like to have any members of r force describe any of these items briefly, we would be glad to e you handle that as you wish.

r. TAYLOR. With reference to this subappropriation I will state it covers our general plant pathological laboratory and our t-disease collections, which contain the plant-disease herbarium by all pathological workers in the bureau. As indicated in the , the additional $4,000 is for increased work upon the Granville cco wilt, which is doing great damage in Florida, as well as in th Carolina and other southern tobacco-growing regions, and I ask Dr. E. F. Smith, who has charge of the pathological labory, to discuss his work along the lines which you have suggested.

TEMENT OF DR. ERWIN F. SMITH, PATHOLOGIST IN CHARGE THE LABORATORY OF PLANT PATHOLOGY, BUREAU OF ANT INDUSTRY.

ie CHAIRMAN. Dr. Smith, let me suggest that you make your ment as briefly as you can, and do so comprehensively, because have a great many of these items, and would like to hurry g as rapidly as we can.

. SMITH. I will show you some photographs, if you care to at them, and tell you something about two or three of these dis-. The first is the wilt of cucumber and similar plants. This rs all over the United States where these plants are grown. transmitted by insects. A beetle bites the leaf, and from that wilt spreads until the whole plant is wilted [exhibiting photohs]. There [exhibiting photograph] is another example of it appears. Years ago I came to the conclusion that this was terial disease. I worked it out according to the methods of the riologists and proved it to be such. I also proved that it was mitted by certain leaf-eating insects. They transmit this disreadily from plant to plant in the summer time. Here [exhibitphotograph] is another example of an inoculated plant. I lated these plants simply by making a few needle pricks. This ibiting photograph] is a picture of the striped cucumber beetle. ve proved conclusively that this insect carries the disease from t to plant in the fields and in the hothouses. That [exhibiting ograph showing a leaf riddled with holes] is what a diseased looks like after the beetle has attacked it. They transmit this se from the diseased plants to the healthy ones. I have dised that these beetles seem to prefer diseased plants. It is thing like a salad to them. They consume these diseased plants, then their jaws are contaminated by these sticky microorgan-, and to the next plant they go to they transmit the disease.

r. MCLAUGHLIN. The new feature about this matter is the dis-ry of the transmission of the disease by the beetle, is it not?

Dr. SMITH. No, sir: I proved that some years ago. The new feature is this: I suspected the beetle of carrying the germ over winter, harboring it in their bodies, and now we have proved that to be true. I thought that the organisms were carried over winter in the bodies of the beetle, just as we have some people carrying diphtheria or typhoid fever and transmitting it to other people even after they themselves have recovered. To test this last year one of my assistants grew cucumbers extensively in two fields, under insect-proof cages or boxes 4 feet square, and none of the protected plants contracted the disease, but hundreds of plants all around the boxes did. These were fields where the disease also prevailed extensively in 1914. There were only two exceptions to that statement. Early in the summer before the disease appeared he caught several beetles and put them into one cage, and they transmitted the disease. Later in the season a beetle crawled into one other box and bit a plant and transmitted the disease. All the plants in the other 48 cages remained healthy. This is evidence that the beetle not only transmits this disease in the summer time but also carries it over winter in its body and begins to spread the disease in the spring as soon as he comes out of hibernation, and the campaign from now on seems to be to find methods of destroying the beetles.

The CHAIRMAN. Suppose you take up another line of work. We discussed this line of work rather fully the other day.

Dr. SMITH. That disease is comparatively a small item of loss in the United States, although I know of one pickle factory that was abandoned on account of it. I will next call your attention to the bacterial rot of potato. This disease is one that takes a toll of many thousands of dollars every year from the potato sections of the United States. This is known as the soft rot of the potato, in contradistinction to another bacterial rot known as brown rot. I show you here a picture of healthy plants, with diseased plants in the foreground. These have been inoculated five days. Here [exhibiting photograph] is another, where the disease has taken the whole plant. These plants have been inoculated only seven days. You see it is a very rapid, destructive disease. It is a disease that prevails every year and in certain years (called bad years) takes a heavy toll of the potato crop.

The CHAIRMAN. You mean white potatoes?

Dr. SMITH. Yes, sir; I am speaking of the soft rot of the Irish potato.

The CHAIRMAN. What do you call the disease?

Dr. SMITH. Bacterial soft rot of the white potato.

The CHAIRMAN. It is not a scab disease?

Dr. SMITH. No, sir; it is a deep disease. It rots the stems and the tubers in the field, and it also rots the tubers in storage.

The CHAIRMAN. Have you found anything which will prevent that?

Dr. SMITH. No, sir; except in storage. In stored potatoes, if the temperature is kept low, the rot will not proceed.

Mr. HAWLEY. Do you know the organism which causes this?

Dr. SMITH. Yes, sir; and we have a hope, not of altogether eliminating it, but of reducing the intensity of the disease in the field.

The CHAIRMAN. Is it a very destructive disease?

Dr. SMITH. Yes, sir; some years thirty, forty, or fifty million bushels of potatoes are destroyed by it.

The CHAIRMAN. Does it occur all over the potato sections of the country?

Dr. SMITH. Yes, sir; wherever potatoes are grown.

The CHAIRMAN. Now, take up the next item.

Dr. SMITH. This is a bacterial disease of cotton. It spots the leaves and they turn yellow and drop off. It also attacks the stems and the bolls. Young plants are frequently killed by it; old, not. Here [exhibiting photograph] is one of the pure-culture inoculations.

The CHAIRMAN. What effect does that have on the cotton plant?

Dr. SMITH. It reduces the productivity of the plant.

The CHAIRMAN. What is the name of the disease?

Dr. SMITH. It has several names according to the part attacked. Black arm, angular leaf-spot, and boll rot are its names.

The CHAIRMAN. Boll rot is a common name in the South for anthracnose.

Dr. SMITH. I do not know definitely, but it seems probable that this precedes anthracnose and paves the way for it. I have experiments under way to determine that. It looks as though this thing comes in and makes the opening—the initial wound—and then the fungus comes along and does more damage than the original organism. The bacterial organism of itself, however, is able to injure the boll and not the cotton.

The CHAIRMAN. Are you making a study of anthracnose?

Dr. SMITH. I am not, except as far as relates to this disease.

The CHAIRMAN. Is anyone in the bureau making a study?

Dr. SMITH. Yes, sir; I think so. Here is a serious disease of the tomato [exhibiting photograph]. You will see one row showing an inoculation. It has been inoculated about three weeks. It was inoculated by putting in the needle pricks on the stems, and all the plants are now dead. I have called it the Grand Rapids tomato disease because I first had it from that place in Michigan, where one firm lost 100 acres of tomatoes by this obscure trouble. I have since found the trouble exists in Massachusetts and New York, and it probably occurs in other tomato-growing States. You will see from this photograph [exhibiting] what a destructive thing it is.

The CHAIRMAN. Your remedy, as I understand, is a sort of vaccine remedy?

Dr. SMITH. No, sir.

The CHAIRMAN. What is the disease called?

Dr. SMITH. It is known as a bacterial disease.

Mr. HAWLEY. Have you found any remedy for it?

Dr. SMITH. No, sir; that is still to be found.

Mr. MCLAUGHLIN. Is it contagious?

Dr. SMITH. Yes, sir; very contagious. I had some West Indian plants that belong to the same family as the potato, which we were growing because we thought it was a suitable stock for crossing, since it was resistant to another disease that we had worked on. This particular disease—the organisms of this particular disease—escaped from some inoculated tomato plants into a bed of those plants. It took hold of these West Indian plants and spread all over them and destroyed them.

Mr. McLAUGHLIN. What steps are necessary to prevent it?

Dr. SMITH. First we have to know whether it is a seed-borne disease or not.

Mr. McLAUGHLIN. You are not taking any precautions, so far?

Dr. SMITH. We are not able as yet to say definitely whether it is transmitted by the seed, and if it were we have no means of controlling the seedsman.

Mr. HAWLEY. How did it seem to spread in the hothouses?

Dr. SMITH. I think the gardener was the cause of its getting disseminated in the hothouse. You know how gardeners sprinkle one plant after another, and if he did that and spattered water from diseased plants onto healthy ones, then he would inevitably have spread the germs of it over the healthy plants, because in this disease the bacteria ooze very freely to the surface of the plants.

Mr. HAWLEY. In what States is it most prevalent?

Dr. SMITH. I discovered it in Michigan, but it occurs also in New York and Massachusetts and probably in all of the Northern States.

Mr. HAWLEY. Have you any complaints of it in the Western States?

Dr. SMITH. Not that I definitely know. I suspect a bad disease that came to my notice years ago in Texas was this same disease, but we knew nothing of this organism then.

Mr. HAWLEY. Where did it come from originally?

Dr. SMITH. I suppose the Lord made it. In other words, I do not know.

Mr. HAWLEY. I mean did it come from some foreign country?

Dr. SMITH. No, sir; I do not suspect that. I think we give as much to Europe as we get from Europe in the way of parasites.

Mr. HAWLEY. There is nothing to prevent its spreading over another country?

Dr. SMITH. Absolutely nothing. From other bacterial diseases I am working on we know that the seeds may spread a disease. We know it now positively in the case of Stewart's disease of sweet corn and in the case of black rot of cabbage. We probably got the latter disease from Denmark or Holland. Seedsmen disseminate these two diseases.

Mr. HAWLEY. Have you examined any seeds to see if they are to blame?

Dr. SMITH. In stem-inoculated tomato plants I have several times traced the disease into the fruits and to the immediate vicinity of the seeds, but I have not yet proved that seeds bought on the open market are contaminated by it, as I have done in the case of the sweet-corn disease. That is the next step.

Mr. HOWELL. Tomato growing in my State is quite an important industry, and it occurs to me that perhaps we might introduce this disease there unawares. Have any means been taken to prevent its spread?

Dr. SMITH. It is a serious disease to introduce into any free locality.

Mr. BYERSIN. Is there any way of preventing this?

Dr. SMITH. I think there is, especially if it should turn out to be transmitted on the seed, as I suspect will be the case.

The CHAIRMAN. Take up the next matter.

Dr. SMITH. I am now going to talk about tobacco, not because I like tobacco personally or because I think it is as important as pota-

nd wheat and other foods, but because, commercially, it is an tant crop.

CHAIRMAN. That is an item for which you want an increase of ?

SMITH. This is a disease which I discovered years ago in pota- omatoes, and eggplants. It attacks various plants in that and also some plants outside of that family. It has been par- ly bad in recent years in our tobacco-growing regions in the —in Florida and in the Carolinas. It is a bacterial disease. ads rapidly, and this picture [exhibiting] shows what it does plant when a few delicate wounds have been made in it intro- the right organism. There [exhibiting photograph] is a dis- lant taken out of a North Carolina field and brought to Wash- and set out in a hothouse. It recovered for a time from the , apparently, and then the leaves wilted again. Here [ex- g another photograph] is a small seedling tobacco plant, per- healthy until I made a few needle pricks in it and inoculated then [exhibiting photograph] that is what happened within a Here [exhibiting another photograph] is a whole bunch of ted plants. This is what it does to wrapper leaf [exhibiting kled and distorted specimen]. This organism is not only in ited States, but in recent years it has been found to be a serious of tobacco in the Dutch East Indies—Sumatra—in Japan, robably in South Africa. The Dutch are spending much trying to combat it. In our Southern States it is also a disease of tomatoes and potatoes.

CHAIRMAN. You say you discovered this disease yourself?

SMITH. Yes, sir; that is, the organism causing it.

CHAIRMAN. How long ago?

SMITH. It must have been 20 years ago when I first found it lants and tomatoes and inoculated it into potatoes. My first ment bulletin on this subject was in 1896.

CHAIRMAN. How long since you discovered this disease in the ?

SMITH. I suppose the time when I knew definitely and clearly e potato disease was the same as the tobacco disease was about ears ago.

CHAIRMAN. During all of that time you have been endeavor- discover a remedy?

SMITH. Plodding along and trying out what I could. It is hard to wring enough money out of Congress to do research ut the little I could get I have done with it what I could. ust remember, also, that I am working on many diseases.

CHAIRMAN. Your idea is to have this increase to employ one more specialists on this proposition?

SMITH. We know a good deal about the organism now. We for instance, that it is very sensitive to drying. My idea in the Florida experiments was that we might dry the wilt or- out of the soils by repeated tillage or, by some method of ation, so strengthen the plants as to enable them to over- e disease. That is what we are trying to do in Florida.

CHAIRMAN. Is there anything further, Dr. Smith?

Dr. SMITH. Yes, sir; there are one or two other things I would like to talk about. There is a wheat disease in our western States that bids fair, I think, to become a serious trouble, and I should like very much to work on it. This is what it does [exhibiting photograph]. It dwarfs the heads and the kernels in the heads. They shrivel sometimes to not more than one-quarter of their original size.

Mr. HAUGEN. What is the disease.

Dr. SMITH. It is not named. You may call it Smith's disease if you like. This is what it does [exhibiting photograph]. Here [exhibiting photograph] you will see the same thing on this one. These black stripes on the stems below the heads show where the bacteria have infected them.

The CHAIRMAN. Is that different from black rust?

Dr. SMITH. Yes, sir; it is entirely different. This is a bacterial disease; rust is a fungous disease. Here [exhibiting photograph] you will see the diseased stripes on the chaff. Now, I want, if possible, to find out something about the biology of this organism and the way, if there is some way, to head it off. If this keeps on, we shall soon have a destructive disease in the wheat fields of this country in comparison with which the tobacco disease will be a matter of small consequence.

Mr. HAUGEN. To what extent has the department been studying that disease?

Dr. TAYLOR. A definite increase in our work on grain rust has occurred this year, which will be discussed under the cereal-investigation item.

Mr. HAUGEN. That will come later?

Dr. TAYLOR. Yes, sir.

The CHAIRMAN. Do not forget to bring that out, Mr. Haugen.

Mr. HAUGEN. All right.

Mr. MCLAUGHLIN. How long has this disease existed?

Dr. SMITH. I do not know.

Mr. STEELE. This disease has been known a number of years. I have discovered in my own wheat fields this disease on different plants.

Dr. SMITH. I suspect that this disease has been in the country, slowly increasing, for quite a good while. The first I knew about the disease was 10 years ago. I had then one single wheat head showing it sent to me from Indiana. This year it was very destructive in Kansas, and the farmers are all scared. It looks as though it would be a good idea to get to work on this in order to acquire some knowledge of it so, in case it should become destructive, we should have some method of dealing with it rather than wait and ask $4,000,000 to wipe it out when it has gained a serious foothold.

Mr. WILSON. We have something to do with appropriating the money but are not good bacteriologists. How much money do you suggest now?

Dr. SMITH. I do not want to go over what the Secretary has estimated. I will stick to his estimates. I do not want you to cut them down, however.

The CHAIRMAN. You can begin a study of this disease if the committee will allow your estimate?

Dr. SMITH. Yes, sir. I have here finally [exhibiting photographs] some illustrations of crown gall.

Chairman. What other discovery have you made with refer-
o that?
Smith. I have made one recent discovery that ties up the
sition more closely to cancer. I have nothing definite to report
animal inoculations. I think I shall have something very inter-
to report on crown gall later. Here is the other disease, the
ubercle [exhibiting photograph]. I am working on that. This
ike crown gall, but it is totally different in its anatomy. It is a
sease in California.

MENT OF MR. M. B. WAITE, PATHOLOGIST IN CHARGE FRUIT-DISEASE INVESTIGATIONS, BUREAU OF PLANT USTRY.

Chairman. Item 74, "For the control of diseases of orchard
ther fruits." We seem to have an increase there of $7,500,
for general orchard diseases and $5,000 for citrus and sub-
il fruit diseases.
Taylor. Yes, sir. Mr. Chairman, under this subappropriation
ry our investigations of diseases of orchard and other fruits,
ing grapes and small fruits. It is proposed to continue the
ow under way, to increase the work on our general orchard-
projects and to increase our work on the citrus and subtropical
liseases, including citrus canker. This is all investigational

Steele. A very large appropriation has been asked for this
canker business. Will the work, if done under that appro-
n, conflict with this?
Taylor. No, sir; the bills pending relating to citrus canker,
vhich the hearing was had, are with reference to systematic
ation and not to investigation.
Steele. This is a study to learn the causes, sources, remedies,

Taylor. To study the life history of the organism and to work
thods of control. This is an investigational proposition.
Rubey. There is an appropriation of $300,000 pending in the
ncy appropriation bill.
Taylor. There was a supplementary estimate for funds for
canker eradication. That was submitted this year in connec-
ith the urgent deficiency bill. It is the understanding that
ould be administered by the Bureau of Plant Industry, as was
00 emergency appropriation made a year ago.
Chairman. I take it that your study of the canker situation
this item is research work?
Taylor. Yes, sir; under this item it is research work exclu-
and, if it is the pleasure of the committee, I will ask Mr. Waite,
s charge of these investigations, to discuss those features.
Chairman. The committee can not give you very much time,
aite, and we would request that you compress your statement
h as possible.
Waite. There are so many details about the numerous projects
t diseases that to attempt to go into them all would, I know,
the committee with a mass of details in which you have no

interest, and perhaps the best way to give you a complete idea of what we are doing is to run over the main-group projects and to answer questions as to specific projects. If you are interested in seeing some of the germs themselves, I can show you some, also pictures of the diseases.

The projects are arranged in groups. The main group of general orchard diseases includes such projects as pear blight. You know all about that great epidemic blight on the pears and apples last year. I have a few pictures which will give you some idea, perhaps, of that disease. It is an old subject. That diseases is so destructive that a picture like that [exhibiting] will perhaps bring it home to you better than anything I can say. It takes a tremendous tax on the pear and apple industry in this country every year; in fact, the enormous amounts of damage by these fruit diseases is something which can hardly be appreciated by anyone not familiar with the troubles of the orchardists in the field. Perhaps I can give you some idea of it by the number of inquiries and appeals—often rather desperate appeals—that come to us for help. It is not extraordinary at all to have a whole industry wiped out in certain sections. Our southern Le Conte pear industry was wiped out by a single germ. The pear industry of California was desperately menaced. One-third of it, the San Joaquin Valley, was wiped out. The northern part of the State was also affected. This department can claim most of the credit for saving it, not only by scientific investigations, in which we discovered the method of cutting out the hold-over blight, illustrated in this picture [exhibiting], but by what we might call service work. The prime work of this office and this group of men we consider to be investigational work—the discovery, the finding and creating, of new knowledge both as to the organisms, germs, and diseases and as to methods of control. We were called upon very urgently in this case by the governor, two Senators, and five Representatives in California to go out and help them in the actual fight itself. We call that service work. We do a great deal of that—perhaps more than we ought to. It diverts our time and attention from the real discoveries from research, which perhaps is our fundamental work. It is better to have State agencies and other institutions do that work when practicable.

Mr. HAWLEY. Is that work so difficult that a scientist from the department is necessary, or can instructions be given to an ordinary orchardist, so he can carry on the work himself?

Mr. WAITE. In this particular disease the detection and eradication of the hold-over blight have proved to be rather too difficult to do without demonstrations and examples. In California the method of procedure was along the lines which you have perhaps suggested in your question. They had the written and printed instructions, but they needed actual demonstrations on the ground. The way that was done was to cooperate with the State experiment station and university people, the State commissioner of horticulture and his deputies, and the orchardists themselves, and everyone of them so instructed became then a new instructor, who passed the thing along. It is a good deal like saying: Can we not write instructions to a mason to build a brick wall, especially if one had never been built before. It takes hand-to-hand instruction. That is often necessary

to start off a new thing. I hope I can impress upon you that many of the things we do have never been done before. That is our work—to discover new methods. From our standpoint the discoveries are of first importance, but we find it necessary to get the thing properly started, and hence we have to do a large amount of service work.

The CHAIRMAN. When you have discovered a pear tree with the blight, I take it from the picture which you have shown us that you cut out the diseased part of the tree?

Mr. WAITE. We cut out the blight in the summer time, and in the winter time we particularly try to find the hold-over blight. The main treatment of pear blight consists in finding and cutting out the hold-over blight and disinfecting the wounds with corrosive sublimate or by some similar method.

The CHAIRMAN. Can you tell the hold-over blight when you see it with the naked eye?

Mr. WAITE. Yes, sir; it has a brownish color. One type of hold-over blight, at the collar or base of the tree, is often hard to find. It destroys many thousands of trees each year. Pear blight, fortunately, discolors the tissues enough so one can see it after it has been three days in a given tissue in the summer time—perhaps longer in the winter time.

Mr. WILSON. Does it kill the tree?

Mr. WAITE. It kills the part of the tree actually reached. If it works down from the top it kills the top, as this picture [exhibiting] shows. If it attacks the trees at the thick bark at the base, an area of blight only as big as my two hands kills the tree. In this case [exhibiting a photograph] the tree has died because the blight is localized at the base of the tree.

Mr. REILLY. Have you discovered a method of preventing this disease by spraying?

Mr. WAITE. We tried that, but it was not successful. Let me very briefly give you an outline of the successful methods of control of plant diseases—fruit diseases. The first method is by spraying. Many are cured by spraying; and the fact of the matter is that some of our greatest triumphs of the last few years are the result of spraying. The second method is disinfecting—that is, using material too strong to spray and putting it on the seeds, soils, hotbeds, greenhouses, etc.

Mr. REILLY. You can not use that method in an old orchard, can you?

Mr. WAITE. Only in wound treatment. These methods are often combined. For instance, the disinfecting principle is used in seed treatment. It is used in some of the work in treating the crown gall in keeping the stock clean.

I am giving you all the different methods of attacking disease. There are six of them. The third is by cultural methods. This is an older way—the way of the farmers. That consists in growing the plants so thriftily that they grow and bear in spite of the disease. In pear and apple culture the very unfortunate thing about this is that in attempting to check the blight we have to check the growth of the trees. The more vigorous and the more sappy and juicy the growth the more susceptible the tree is to this disease.

The fourth method is by the use of resistant varieties—by breeding and selecting resistant sorts and resistant stocks. That is about the highest type of plant-disease control. That is the thing toward which we are looking forward as the ultimate goal—to have plants developed that will stand up against disease.

The CHAIRMAN. What measure of success have you had up to this time?

Mr. WAITE. We are working on this line, but with only moderate success. In one instance we have had very great success: we have a very fine apple known as the Grimes Golden. I hope you all know that variety. It is a very desirable commercial apple in some respects, but it has one weakness—it is susceptible to collar blight. It is more susceptible to collar blight than any other largely grown apple; so much so that the bearing orchards have been almost exterminated in many Appalachian Mountain and Valley districts in Virginia, West Virginia, Maryland, and parts of Pennsylvania. The only reason we have them as abundantly as we do on the market is that young orchards come on quickly enough to replace those that are exterminated; but the Grimes Golden is very badly used up by this disease. We are getting around that by growing other varieties, like Stayman Winesap, Mammoth Black Twig, Northwestern Greening, etc., which are resistant to this disease, up to 2 or 3 feet above the ground and then grafting this variety on them. That is what we have been recommending to the people for several years. It seems to be thoroughly making good.

The CHAIRMAN. Take the next line of work.

Mr. WAITE. I can not take the time to speak about the other diseases as I have about the pear blight, for fear I will tire you. In this general group comes the nut diseases. As you know, the pecan industry is getting to be quite important in the Southern States. Here is the apple blackheart [exhibiting photograph]. This picture [exhibiting] will represent the group of apple cankers, which are not dangerous, but annoying, and continually giving us trouble. Here is a disease, the apple bitter rot, which has cost the country in a single year $10,000,000. The National Apple Shippers' Association estimated the loss one single season from bitter rot at $10,000,000. That has been brought under control by spraying, and finally one little kink has been corrected in the last two seasons that put the finishing touches on the control of that disease. The treatment by spraying was worked out in 1906 and 1907 by a very able associate of mine. There was always something wrong with certain orchards, so that we could not entirely successfully prevent the bitter rot. The routine spraying methods of treatment applied thoroughly would fail. Another associate of mine found and corrected the trouble recently. It is due to certain little dead twigs and injured places where this disease lurks. I will illustrate this by a picture of another disease, known as the black rot, which works in the same way. He found there was excessive infection from these sources and that the spraying method, while it reduced the disease, would not control it. At an expense of about 5 or 10 cents per tree for large apple trees the men went thoroughly over these trees, first experimentally and then, last year, on a large scale, and carefully hunted out and wiped out these small infection sources by pruning. In other words, we com-

l pruning and eradication methods with the spraying before
)t final results.
: CHAIRMAN. In what season of the year did you do that?
WAITE. In the wintertime or preferably before the growth
s in the spring.
CHAIRMAN. When is the spraying done?
WAITE. In late summer. We spray for bitter rot in Arkansas
:her sections from June through the last half of summer.
CHAIRMAN. After the apples are about half grown?
WAITE. Yes, sir; in the case of winter fruit.
CHAIRMAN. That spraying process was discovered by the de-
ent?
WAITE. We can hardly say that, Mr. Chairman. The pioneer
ng was done back in the seventies for codling moth and insect
The real foundation for spraying for plant diseases was
ished by a Frenchman, Millardet, who gave us the first effective
:ide, Bordeaux mixture, in 1885. In 1886 our department took
ınd kept up the work.
CHAIRMAN. Do you know who discovered the spraying proc-
now conducted, to control all these apple diseases?
WAITE. You mean this bitter rot?
CHAIRMAN. In other words, I was trying to give you credit
ving $10,000,000 to the people of this country, if you will
:.
WAITE. Thank you.
REILLY. Is the spraying item expensive?
WAITE. Yes, sir; it is rather expensive. The fifth method of
l of plant diseases is eradication. With some diseases eradica-
vastly more effective than spraying. It is a curious thing, but
). that it is harder to get growers and practical orchardists to
eradication methods than spraying. They can see the effective-
f going out and spraying the trees. They are willing to pay
r five hundred dollars or more for spraying each year. It is
all rare for a man with a one-sprayer outfit to spend $500 a
) spray a 100-acre orchard. I know of one man in Virginia
)00 acres with five sprayer outfits. He spends two or three
nd dollars annually, but he has a fifteen to thirty thousand
apple crop as the result.
WILSON. He is not bothered with diseases on his apple crop,

WAITE. Yes, sir; he is.
REILLY. After a man has eradicated the disease one year he
insured against being bothered again, is he?
WAITE. No, sir: not absolutely in all cases. There is one
l which looks to the absolute extermination of the disease. We
one that sometimes locally in pear blight, but had to give it
ıct practical for large districts.
ıake the discussion complete, I will state that the sixth method
'antine. That consists in keeping the disease out of the coun-
n order to keep from talking too long, I will hurry over these
Here [exhibiting a photograph] is a serious apple disease.
ne of the most interesting diseases that has ever come up in
ork, but it will take too long to go into the history of it. This

disease is known as the cedar rust of the apple. The cedar rus
fungous disease native to the wild red cedar and the wild hawt
and crab apple. It was found out by investigations in 1865 in E
that this family of fungi have two generations—one on the c
and one on the pomaceous fruits. A few years ago Dr. Farlo
Harvard University, discovered that this particular cedar fu
produces a common rust of crabapples. There are abou
known species of this type, but this one has taken upon its
attack itself after 100 or 200 years of cultivation to the Eur
apple. It has taken over the cultivated apple as a host plant, ar
come right up since 1907. The evolution of this fungus has
place before our very eyes. It has now become one of the most s
diseases of the eastern apple orchards—not only serious in fact
a psychological sense. It has caused almost a panic at times.
remedy is most effective and satisfactory from our standpoint.
the destruction of the groves of red cedar trees within one o
miles of the orchard. Cut down the cedar trees around the
orchards and the disease is not only cured and stopped in the
but permanently eradicated from the community.

Mr. HAWLEY. How is the disease carried?

Mr. WAITE. By the wind. Pear blight, on the other hand, is c
by insects. If you will pardon my taking a little personal credit, t
the first bacterial disease demonstrated to be transmitted by ins
not only the first plant disease but the first bacterial disease o
kind. It was discovered in 1891 before the transmission of ba
by insects in the case of animal and human diseases was worke

The CHAIRMAN. You started to discuss another feature o
orchard-disease work, the pecan diseases. Will this interfere
that?

Mr. WAITE. No, sir. We have an assistant giving his entire
to the nut diseases, and about 90 per cent of that is devoted t
pecan diseases. I gave that personal attention a few years ag
that is now turned over to an assistant, who is devoting his ful
to it. I made a trip to South Carolina this fall in that work. W
investigating the fungous diseases of pecans, and to some exte
physiological diseases. We have straightened out the scab tr
very well. We concluded that the best way to overcome that w
top grafting of resistant sorts. We can remedy that disea
spraying, but the pecan trees are large—often too large to p
of successful spraying. The pecan rosette is bothering us a
deal. It is not a fungous disease, but a nutritional disease—a pl
logical disease. We are convinced that it originates from a
proper condition of the soil, but just what that improper con
is we have been unable to determine as yet. We started a numb
experiments this last fall to try to remedy it by empirical me
without knowing precisely the cause of the disease. That [exhil
a photograph] is the apple leaf-spot.

Let us go on now to another group—citrus and subtropical
diseases. The interest in citrus diseases has greatly increased.
tripled within the last 18 months. The office is besieged wit
queries about all types of citrus diseases—probably three tim
much as it has ever been before. A large part of those inq
relate to the citrus canker, and considerable attention has bee
voted to actually investigating citrus canker. The cause of

e was discovered by Miss Clara Hasse, an assistant pathologist s office. Here [exhibiting] are some pictures of the citrus :. It might be of interest also to see some of that disease. In articular specimen [exhibiting], which is on one of the rather nt hosts of the disease. the worst leaves have all fallen off. f the features of that disease is that the worst affected leaves ff. This is another picture [exhibiting] on that subject. It is the State of Florida. This specimen [exhibiting] represents ain amount of interest, because it is a disease produced artifi- in the greenhouses here in the course of study. I do not know er I quite understand the workings of this committee to tell er you would be interested in seeing the germ of citrus canker.

ERAL MEMBERS OF THE COMMITTEE. Yes; we would.

ıe specimens, which were protected by a celluloid cover, and cul- were thereupon exhibited to the members of the committee.)

WAITE. This item under discussion here backs up by scientific igation a lot of the other work going on with the citrus canker.

HAUGEN. Does this work come under your division?

WAITE. The scientific research does. That phase is admin- l separately from the eradication fund. I am very proud to hat an associate discovered the cause of the citrus canker, and d it conclusively by a number of experiments.

WILSON. What is the cause?

WAITE. There it is in your hand [indicating]. That is known canker germ, *Pseudomonas citri*. That name was given by Hasse. We have got the germ now. We want to do more than nowever. That is only a preliminary step. We are trying to ut more about how it lives. For instance, it is a resistant germ. ıot a germ that produces spores. It is a rather resistant germ nonspore-bearing germ.

CHAIRMAN. You are continuing your studies on this in the of discovering some of these days a preventive or cure?

WAITE. Yes, sir; but especially to aid in its eradication. I say that one very fortunate thing happened. The Florida rs, in their desperate fight to annihilate this disease on its ntry, went on the wrong tack at first and tried to spray for it, ng it was a fungus. Some of the investigators were misled e presence of fungi on these cankered places. There appears to nixture of fungi and several different germs in the cankered but only one germ is the real cause of the disease.

WILSON. They are spraying now, are they not?

WAITE. No; not for citrus canker. Empirically they found ray would not work. Then they started this burning cam- . That was exactly the right method of procedure, as proved e discovery of the germ. No bacterial disease has been pre- l by spraying. These diseases get under the cuticle through ıncture of insects and otherwise and work inside. We have yet succeeded in controlling a bacterial disease directly by ing. We prevent fungus diseases by spraying. The spores of lie on the surface and germinate there, so that by spraying fungicides over the surface we are able to kill them. We are es of finding out some scientific facts in order to give assistance s attempt at extermination. If we knew all about the citrus

canker and the germ, we could probably give them some short cu and better methods.

Furthermore, we do render a great deal of assistance in the way identification and corroboration of field diagnoses, and it is not or nary off-hand identification, but by careful cultures and absolut reliable information.

Mr. HAWLEY. Who is entitled to credit for discovering this bu ing system?

Mr. WAITE. The Florida growers themselves. They found the fallacy of spraying for this malady. They did not know w the trouble was, but they knew it was a good safe procedure to terminate a thing by burning it. They found it was so contagi that they did not want to haul the trees out of the grove. Th therefore decided to burn them in place. We hope to make sc progress on this subject in the laboratories, and we are working this matter, as you see from the specimens I have given you. account of its contagious character, there are certain difficulties investigations on this trouble. We are not in a position to go in the groves of Florida and leave check trees in order to experim with this disease as we would with ordinary diseases. Every c found in Florida has been landed on and burned up.

The CHAIRMAN. All right, Doctor, hurry along, please, sir. Y are making a very interesting statement, but we have to move alo

Mr. WAITE. Along this line it might be interesting to know t the citrus scab is very harmful and doing great injury. We are gaged in studying methods of controlling that. We are working that now. Our citrus group has been entirely reorganized, whicl one of the reasons that brings this increase in this item. We hoping to do this work very much better than before. We hav capable new man, a plant pathologist, Prof. Fulton, now on his fi trip to Florida, and we are trying to develop an effective rout spraying system for citrus fruits, as we have for the apple, pea pear, and grape.

I forgot to mention the pineapple disease. There is really a d perate situation with the pineapple industry in a strip of coun along the east coast of Florida. Our pathologist reported that loss to the pineapple industry in St. Lucie County, due to this dise has been generally estimated at from $500,000 to $800,000.

Mr. HOWELL. That was the loss since the first discovery?

Mr. WAITE. No, sir; during the last three or four years; and c trol of the disease does not look very promising at this time. It n not be a germ disease or a fungous disease that we know how to fi but we are trying to discover some means of remedying it.

No increase is asked for the grape and small fruit diseases. are doing a large amount of work on the cranberry diseases of country. There is a new cranberry industry started on the Pac coast, north and south of the Columbia River, on the marshes th near the sea, and the cultivated cranberries are being attacked diseases of a little native cranberry. So we have a new destruc disease of the cranberry which started up with the new planti there. We are doing a lot of cooperative work there and at N Lisbon, N. J., Grand Rapids, Wis., and East Wareham, Mass. are also studying the strawberry. That is quite an important fr

it has a number of bad diseases in the field—diseases of the plants—but the most of the complaints that reach us are of rots in transit. Our strawberry pathologist is finding that largely due to conditions that develop in the plantation before the fruit is shipped. The control of grape diseases by spraying has been one of the great triumphs of plant pathology in the last 25 years. Doubtless you have heard Dr. Galloway, who was formerly in charge of the Bureau of Plant Industry, talk about that. The problems are not all solved. Most of the common grape diseases, however, have been well investigated and routine methods of spraying for their prevention developed.

The CHAIRMAN. With practical results?

Mr. WAITE. Yes, sir. The first great result in controlling plant diseases was obtained with the grape. The success with the grape is what started plant pathology in this country to moving. They said, "If you can do that well with the grape diseases, why not with the other fruits?" They have been continuing this from that time. Every new discovery brings a demand for another discovery. I do not mind telling you that the farmers of this country are getting an exaggerated idea of the ability of the plant pathologists in Washington to cure their troubles. We fail more than half the time. We succeed in a number of instances, as you know, but a great many diseases are very difficult, and it will take years to handle them. Many of them we fail on completely. Some we get rid of by eradication.

Mr. STEELE. Can you find any business for the farmer to go into where he will not have all these ailments and troubles?

Mr. WAITE. I do not know of any. But you will pardon me for sticking to the fruit-disease lines. The fruit diseases in this country have wonderfully increased. There are reasons for it that people do not know about. It is too big a subject to discuss at length before this committee. America is a new country. Most of our cultivated fruits are intruders on the American continent. Some bring old diseases with them, and these diseases are transplanted to new conditions and something happens. On the other hand, you bring a new host plant, like pear or apple, into the United States and plant it beside the small crabapple, which may have little blight, and immediately this blight jumps at the new intruder and something happens. There is being done as much in America, perhaps, as anywhere in the world to develop more plant diseases. That is why we have these diseases of our cultivated fruits. Sometimes, as in the case of chestnut blight, we bring over a Chinese disease and it is transplanted. Citrus canker is another illustration. That is why we have these great troubles.

Mr. HELGESEN. Would not the important matter be to take steps to prevent the importation of those diseases?

Mr. WAITE. I think one of the finest things we can do, when we can do it, is to shut out the disease at the seaport. But extensive scientific research in plant pathology is comparatively a recent thing. The United States Government first went at it in 1886. It is a tremendous project. We know only a little about it. We are comparatively children, but we are getting to the point where we know how to shut the things out. We research men feel that if the Federal Horticultural Board and their splendid work had been inaugurated five or six years sooner instead of two years ago we probably

would have shut out the citrus canker. If it had been started 15 or 20 years ago, we probably would have shut out the chestnut-bark disease, and so on back.

There is only one thing more I want to say—two small items—and I will close. We have all over the West, particularly in the irrigated orchards of the West, where the soils are not washed free from alkalies and other substances that accumulate in them, a great group of diseases which we call physiological diseases—malnutrition diseases, chlorotic diseases, and apple rosette. They are causing a vast amount of damage to the irrigated orchards. They are causing a great many disappointments. The Department of Agriculture is investigating them in rather a feeble sort of way. Six thousand five hundred dollars is all we can allot to that group; and we are making some progress, but not very much. That is a very difficult group of diseases to study and a very unpromising line. I have held to the position in the discussions which we have in the department that is the function of our department to take up these difficult and unpromising problems. I set one man on the problem of bitter-rot control. It was very difficult—difficult because no one else had conquered it. He settled it within five years. I think it is a peculiarly appropriate work that we should take up these difficult problems of plant-disease research.

The prune brown rot is another trouble that has occurred within the last two or three years. The prune crops of Oregon and Washington have been gradually falling off in yield. We heard about that in a general way but did not know what it meant. In the summer of 1914 two sets of specimens of diseased prune blossoms were received, and I found they were infected by the regular peach brown rot, which we have controlled in the East by spraying, and I wrote back to the gentleman who sent the specimens, located near Vancouver, to that effect. He came back with a letter asking for suggestions; I gave them, and he followed with another letter calling for a man to work on the disease. We did have our men who were studying the apple bitter pit at Wenatchee devote part of their time to this work, and they have partly controlled it. They have found out what is the matter. They have discovered that the spraying has to be begun in the bud. We are going to repeat that work and improve it, and we hope to get still better results this season. We will get out a preliminary bulletin to help the growers this coming spring, because we have partly solved the trouble. I do not suppose it will be necessary to go into the details of that.

Mr. HELGESEN. You got some practical results?

Mr. WAITE. Yes, sir; we had four times as many prunes set as a result of spraying as we did from the unsprayed controls. The weak point was that, because of the rains and the imperfections of the sprays, we did not get the full result of the spraying. We were dealing with about one-fourth of a crop.

Mr. HELGESEN. And how much greater did you get the crop?

Mr. WAITE. We got four times as many prunes on the sprayed trees as on the unsprayed.

Mr. HAWLEY. I am glad to hear you say that, because the prune growers of Oregon have written me that they have had great trouble.

Mr. WAITE. We think we will land that. We have to disorganize work a little and put out bitter-pit man in Washington on that k, because he is closer.

want to point out the great advantages to be derived from this k by cooperating with the Federal Horticultural Board and with Insecticide and Fungicide Board.

r. RUBEY. We have in our State a State fruit experimental sta- . There may be stations of that kind in other States. What ngements have you for cooperation with those stations, so that may receive the benefit of your work and you the benefit of tever work they may do along these lines?

r. WAITE. We cooperated with the very station that you speak hen we went into the Ozarks 10 years ago to spray for their e troubles. We went to spray for apple scab and found that trouble was apple blotch. We cooperated with them and did thorough work. We join work with them wherever it appears able or necessary. However, I might say that the absolutely research work is not always in shape for cooperation. It is to put your scientist on the proposition and let him dig it out . When he gets something ready to put into practical appli- n, we usually find it not only necessary to cooperate with the experiment stations but with any agency in the State engaged sease control.

EMENT OF DR. HAVEN METCALF, PATHOLOGIST IN ARGE OF INVESTIGATIONS IN FOREST PATHOLOGY, BUREAU PLANT INDUSTRY.

e CHAIRMAN. The next item is item 75:

the investigation of diseases of forest and ornamental trees and shrubs, ling a study of the nature and habits of the parasitic fungi causing the nut-tree bark disease, the white-pine blister rust, and other epidemic tree es, for the purpose of discovering new methods of control.

should like to have whoever is in charge of that make a brief ment.

. TAYLOR. Dr. Metcalf will outline briefly what is covered by 75, under which several important diseases are under investi- n.

. METCALF. I will discuss this matter in the order in which our cts stand—not in the order of importance. Our first project with the diseases of forest and ornamental trees and shrubs. started as a research project, but in recent years our research has been almost completely swamped by the volume of our spondence. It seems as though nearly every man in the United s has an ornamental tree in his front yard with something the r with it. In the last fiscal year we wrote about 11,000 letters at subject. It appears to be necessary, if these questions are , to answer them, but it has greatly interfered with our research . We have concentrated the research work on that subject very ly on improving methods of tree surgery. Tree surgery is a ct in which I think there is more faking done than in any line siness that I know of, and we are endeavoring to get the work sound scientific basis so that we can promulgate definite facts

in regard to it, so everybody can know what they can do themselves and what they can expect from the commercial tree surgeon. We have already published quite a little on that point. We have had on that project a rather big by-product, which is important for some of the southwestern cities. In certain localities in the Southwest the cotton produced by the cottonwood tree, planted as street trees in cities and towns, is represented to be a great nuisance. Apparently a simple spray will kill the catkins and abate the nuisance. Our experiments have been conducted in Albuquerque, N. Mex.

Mr. HAUGEN. What do you spray them with?

Dr. METCALF. One per cent sulphuric acid.

Mr. HAUGEN. In what way is it a nuisance?

Dr. METCALF. It is represented locally as being the cause of about every disease that affects the nose and throat. It blows about like snow. In Albuquerque and some other cities it is really a great nuisance, especially to the tubercular patients there.

Our project on the pathological aspects of wood preservation brings out one very interesting point with which we did not start but which developed as a side issue. We started to determine what became of the fire-killed timber, of which there are enormous areas in the West; what could be done to utilize it more advantageously, and how quickly it must be utilized. We found that checking of the wood was a much more serious matter than decay, and, as far as following up decay symptoms is concerned, we have largely abandoned that. But, as a side issue, we made an interesting discovery in Arizona and New Mexico as to the disposal of the brush in the national forests where the land is cut over. The disposal of brush is quite an important item with reference to fire. It cost about 40 cents per thousand feet to dispose of brush in the regular way by piling and burning. Now, in studying the fungi that decay brush we found that a very simple way of brush disposal, by which the brush could be allowed to decay naturally and most quickly, was the most efficient way; and this, instead of costing 40 cents per thousand feet, costs only 13 cents per thousand.

The CHAIRMAN. That is very interesting, but I am wondering how you got into that line of work when your work is simply of an investigational character. Are you not conflicting with the Forest Service?

Dr. METCALF. We have been cooperating there for eight years.

The CHAIRMAN. What is the connection? It is a very interesting statement.

Dr. TAYLOR. There is a systematic and continuing cooperation between our Office of Forest Pathology and the Forest Service maintained at all points in the field where we have men at work, so that the work is directed and is prosecuted with reference, in particular, to the needs of the Forest Service, we being responsible for the disease investigations that affect the trees and timber.

The CHAIRMAN. I am glad you made that statement, because I was afraid Dr. Metcalf would leave the impression upon the committee that, in some respects at least, he was doing work which would conflict with the work of the Forest Service.

Dr. TAYLOR. Through an agreement reached at the beginning of this work, the pathological work upon forest as well as ornamental trees was assigned to the Bureau of Plant Industry, and it is being

prosecuted steadily and harmoniously in cooperation with the Forest Service.

Mr. HOWELL. What is the remedy you mentioned?

Dr. METCALF. The brush is not removed. It is left where it stands.

Mr. HOWELL. You leave the branches as they are cut off the trees without removing them?

Dr. METCALF. Yes, sir; and where the top is cut off it is not limbed.

Mr. HELGESEN. That would be impracticable where the land in the forest is valuable for grazing, would it not?

Dr. METCALF. That method will probably apply only in the Southwestern States.

Mr. HELGESEN. You have reference to some particular locality, then, when you refer to that matter?

Dr. METCALF. Yes, sir; New Mexico, Arizona, and possibly Arkansas.

Mr. HOWELL. How do you guard against the menace of fire?

Dr. METCALF. That is not a greater menace in that section than with piling; because the time in which the piled brush can be burned is very limited.

The CHAIRMAN. Take up the next line of work and give a brief description of that.

Dr. METCALF. Under the subject of diseases of forest nursery stock, we have perhaps had the greatest success. The raising of conifer seedlings—the seedlings of pine and related trees—has been a thing that the American nurseryman has dodged for years. That is the chief reason why pine trees were introduced from Europe, resulting in the wholesale introduction of the white-pine blister rust. The reason the nurserymen have dodged growing those seedlings is that they are very subject to disease, particularly damping off. The nurseryman can never tell when he will have a partial or a total loss.

I have a number of pictures here that show our method of treatment and the results that we have gotten by a simple soil treatment, developed entirely by our office, involving the use of sulphuric acid. It is the simplest kind of fungicide. Wherever we have experimented with it three years in succession, we have been able to completely check damping off, which is the principal disease that causes trouble in the nursery.

Now, as a by-product we have other results that we never expected to get when we started. We started to control the damping off. We found that the soil treatment also killed the weeds. This result alone more than pays for the cost of the treatment. We further find it stimulates the growth of the seedlings. In one of those pictures you will notice some stakes put up among the seedlings, which show how much larger the seedlings treated in this way are. We have also cured some other nursery diseases.

Mr. HELGESEN. You say the seedling treatment has prevented the growth of weeds?

Dr. METCALF. Yes, sir.

Mr. HELGESEN. Would not that be destructive to any other plant life? If it is a cheap process, it would be valuable in all kinds of gardening.

Dr. METCALF. I do not think it would work with all crops. You must have weeds of a different plant type from the crop.

Mr. HELGESEN. Would it destroy the pernicious weeds?

Dr. METCALF. I think it would in cases where the weeds are as different from the crop as they are in conifer nurseries: but we do not get weeds, of course, in these conditions in the case of most crops. The method ought to work well with some tropical crops.

The CHAIRMAN. All right. Doctor.

Dr. METCALF. Now, in connection with the same project, we have a large amount of routine inspections of nurseries that are maintained by the Forest Service. That touches on the point of cooperation that you raised. Under our project, cooperative field studies and demonstrations in forest pathology, we are doing the work in the national forests and in immediate cooperation with the Forest Service. What they are trying to get at there is a system of forest management that takes into account the forest diseases.

I will start around a picture which shows various diseases of this type, which can be handled only by forest management. This office was organized only in 1907, and up to that time little or nothing was known in America about these diseases of forest trees, and in either Government forestry or commercial forestry they were never taken into account. Now, what we are trying to do is to make modifications of forest management that will take these diseases into account. For example, in rotation and reforesting we determine what is the critical age of the forest tree with reference to decay.

For example, we have demonstrated that in one tree on the Pacific coast, the white fir, the critical age is about 150 years. Beyond that age a tree can be definitely figured on as being diseased. You will see in the picture a tree rotted by one of the organisms. It has been important to bring to the forester a full comprehension of the symptoms of this disease on the outside of the tree. For example, you have two trees side by side, one sound and the other hollow on the inside. Looking at them superficially you can not tell the difference, but there are certain symptoms on the outside which when seen once you will know from that time, and a skilled person can tell from the symptoms how much lumber there is in the tree. That makes an enormous difference in estimating on timberland. It reduces the hitherto shrewd guess of the marker and scaler to a scientific basis.

The CHAIRMAN. You do not undertake in this study to find a preventive method for such disease in the forests?

Dr. METCALF. Not if it is an established disease. That would be impractical. We only consider the prevention of spread of a newly imported disease.

Mr. LEE. Does the control of the disease of young pine forests come under your department?

Dr. METCALF. Pine?

Mr. LEE. Yes, sir; blight or whatever you call it.

Dr. METCALF. Yes, sir; the white-pine blister rust. We have not investigated what you have in your section. That is an insect trouble.

Mr. LEE. I did not know whether it came under this section or not.

Dr. METCALF. This work that we are doing on these old-established diseases is corelated with forest management in this way: The Forest Service inserts in the timber-sale contracts, in the sections of the country where these studies have been made, what is

known as the sanitation clause, which requires the cutting of snags, the cutting of diseased as well as healthy trees, and the destruction of the diseased material, with a view to leaving the sound trees for seed. Now, that reform has been brought about entirely by this work. The old practice was to leave for seed the diseased tree, which was worthless for timber, and, of course, the effect of that on the future forest was bad because it was liable to breed disease in other trees, and in the case of many species transmitted a hereditary tendency to become diseased.

Mr. HAWLEY. If the contract requires the destruction of this diseased material and these trees, that is done at the expense of the men who buy the material?

Dr. METCALF. Not wholly. There is an allowance made for that.

Mr. HAWLEY. How much is that per thousand?

Dr. METCALF. I can give you in one case the specific cost of that. In one sale in California there was an allowance of 2 cents a thousand for felling diseased trees, and 3 cents per thousand for felling snags.

Mr. HAWLEY. Is that estimated to cover all the cost of the work?

Dr. METCALF. It is to cover all.

Mr. HELGESEN. What is the contract for sound trees?

Dr. METCALF. I want to say, however, that on occasions where we have worked out the sanitation clause we have found that not only does the work pay for itself but it leaves a small margin of profit in this way: These trees which are marked according to these more exact methods, taking into account the disease in the tree, enable the lumbermen to utilize what sound wood there is in them with a degree of accuracy which could not be done before. Now, there has been in the actual timber sales enough sound wood taken out to pay for the extra cost of cutting and to make a small margin of profit, so that we regard the sanitation gain as a pure gain. The mechanical part of cutting the extra timber pays for itself.

The CHAIRMAN. Now, hurry to one or two of the important lines of your work and cover them as briefly as possible.

Dr. METCALF. The remaining project is "imported and epidemic tree diseases." The diseases that I have been speaking of are old established diseases in this country. We are continually confronted with new importations. The plant quarantine act did not go into effect until 1912, and we have a heritage of the things which were brought in before that time, which are rapidly spreading. The white-pine blister rust is the worst one now.

The CHAIRMAN. I wish you would discuss that briefly, Doctor. We have had a number of petitions and resolutions on that proposition.

Dr. METCALF. The white-pine blister rust is set forth in this colored illustration, which is a chart we circulated in 1910. The white-pine blister rust is an imported disease; it is native to Europe, and perhaps 95 per cent of all the disease now in America came from a single German nursery. We know exactly where it came from.

The CHAIRMAN. How does it affect the tree?

Dr. METCALF. It affects the tree by producing cankers on it by girdling. You can see the cankers on that colored chart. Here is a picture of a large tree which has been killed by being cankered at this point [indicating], and the top is shown to be dead.

The CHAIRMAN. It ultimately kills the tree?

Dr. METCALF. I do not know that in the case of large trees it would actually kill them outright, but it would kill them slowly; it affects the tops and branches and parts of the trunk, makes the tree unhealthy and prevents growth. It kills young trees outright and interferes with reproduction.

Mr. HAWLEY. Does it affect the quality of the timber in the large trees?

Dr. METCALF. It prevents the formation of new timber but does not affect the quality of what is there.

Mr. HAWLEY. Is it a fungous disease?

Dr. METCALF. Yes, sir; it is related to the cedar rust and has the same peculiar life history. It grows for a part of its life on the white pine or other five-leaf pines and then spreads to currants and gooseberries, and spores from the currants or gooseberries go back on the pine.

The CHAIRMAN. Does it destroy the currants and gooseberries?

Dr. METCALF. No, sir; it is not a very serious disease on them.

The CHAIRMAN. Have you discovered any remedy or preventive methods, Doctor?

Dr. METCALF. The only thing that can be done is to destroy one thing or the other, the pines or the currants and gooseberries. As the currants or gooseberries are mostly relatively unimportant, obviously it is necessary to clean them out. When that is done, a complete remedy is found, because the fungus has to pass from the pine over to the currants and gooseberries and then back again to complete its life cycle.

The CHAIRMAN. In other words, it has to seed on two trees?

Dr. METCALF. Yes, sir; or the fungus can not survive.

The CHAIRMAN. What season of the year does it make its transit from one tree to another?

Dr. METCALF. The conspicuous yellow spores of the fungus are formed on the pine from about the 1st of May to the middle of June. Then the spores pass on to the currant leaves and produce a disease there, which continues to spread from currant to currant all through the summer. Then, later in the summer, the spores are produced which pass over to the pine. It has a very complicated life history.

Mr. HAUGEN. To what extent do the forest diseases referred to affect the value of lumber manufactured from diseased trees? Have you given that matter study?

Dr. METCALF. In this case it is very doubtful whether the lumber formed before the disease attacks the tree would be affected. For example, a tree 80 years old, if attacked by disease, would be just as good to utilize then as if you cut the tree down with an ax.

Mr. HAUGEN. For instance, trees killed by fire or other diseases——

Dr. METCALF. They are generally all right if taken soon enough before the wood cracks.

Mr. HAUGEN. How does it affect the value of the lumber?

Dr. METCALF. It would not affect it much if it is taken before it checks.

Mr. HAUGEN. How about the ordinary bark diseases?

Dr. METCALF. It would be all right if taken soon enough.

Mr. HAUGEN. The first year?

Dr. METCALF. In case of trees killed by chestnut-bark disease, two years is the limit.

The CHAIRMAN. Suppose you tell us briefly what you are doing with the chestnut blight.

Dr. METCALF. This year, aside from continuing the research on the spread of the disease and studying the thing as a typical disease—in order to know how this and other imported diseases will spread in the future—we have mainly concentrated our attention on breeding; and you may be interested in seeing specimens of a resistant nut which we have. This nut [exhibiting] is a hybrid between the common chinkapin and the Japanese chestnut. The Japanese chestnut is a big, coarse nut. This is a nut that is thoroughly edible, and the tree is perfectly resistant to the chestnut-bark disease. That does not mean the rehabilitation of the chestnut tree as a forest tree, but it does mean its rehabilitation as a nut tree.

Mr. STEELE. There is one thing you started to tell us about—the difference between the rot on the timber when you had a fire and checking. Was it your thought to convey to the committee the time within which this lumber should be sold? You said something about checking and fires of the timber. I do not think you finished that.

Dr. METCALF. Yes, sir; what I said was that we found checking was a matter of much more seriousness than the decay or rotting, and on that account we did not follow up the study of the rot.

Dr. TAYLOR. It became a matter of inquiry by the Forest Service.

The CHAIRMAN. We are very much obliged to you, gentlemen. The committee will stand adjourned until 3 o'clock this afternoon.

(Thereupon, at 12.10 p. m., a recess was taken until 3 o'clock p. m. of the same day.)

AFTER RECESS.

The committee reconvened at 3 o'clock p. m. pursuant to the taking of recess.

STATEMENT OF DR. W. A. ORTON, PATHOLOGIST IN CHARGE OF COTTON AND TRUCK DISEASE INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, we will take up item 76, on page 59, of the Book of Estimates, "For the control of diseases of cotton, potatoes, truck crops, forage crops, drugs, and related plants, $59,000," an increase there of $3,000.

Dr. TAYLOR. This paragraph, Mr. Chairman, is the one under which is done our work upon diseases of these rather closely related crops—agronomically related, though botanically different. One feature of this work was incidentally discussed in connection with the cucumber-disease work the other day.

The increase of $3,000 is estimated for specifically for the purpose of extending the cotton-disease work under this paragraph, and Dr. Orton, who has charge of all of the work under the paragraph, is here and can discuss it in such detail as you may care to have.

The CHAIRMAN. All right, Dr. Orton; I would like you to compress your statement as much as possible, at the same time giving us as good a picture as you can of your work.

Dr. ORTON. Taking up the subjects in the order of their occurrence in the program of work, we have first to deal with the cotton-disease situation. Our problems here consist primarily in the extension of work on the cotton wilt and root knot, which has been under way for several years. You will remember that we accomplished control of the cotton wilt by breeding resistant varieties. That was done some years ago. The next phase of the question came with the extension of the boll weevil to the Eastern States, when it was necessary to adapt these varieties or to breed new ones, earlier and more suitable for cultivation under boll-weevil conditions. In that respect, we have been able to make very material progress, so that to-day the problem consists more in the extension of the culture of these varieties of cotton. It is for that purpose that the increase is asked.

We find that it is not sufficient to breed a resistant variety of cotton and leave it there, but that the work must be followed up. Competent farmers must be found and trained in the breeding or growing of high-grade selected seed, the county agents in the States must be shown the details of our method of control of the disease, a supply of seed made available in each district, and the work followed up in this way until the farmers are actually in possession of the knowledge and the seed that is necessary for them to control their troubles.

These photographs [exhibiting] illustrate the results that have been accomplished. One card shows the results of the disease in ordinary cotton. The next one shows the same type of land planted to our resistant cotton; and the third represents a number of fields where the two were grown side by side in our resistance tests.

The CHAIRMAN. Where have you conducted that work largely?

Dr. ORTON. We are doing a large part of this work in South Carolina and some of it in Alabama also. We have had considerable in the State of Georgia, but Georgia has now made large appropriations for cotton-wilt work and further support from the department was thought unnecessary.

The CHAIRMAN. You have done some work also with reference to wilt in cowpeas, have you not?

Dr. ORTON. Yes. That is, in many ways, an essential feature of the cotton problem, inasmuch as one of the diseases, the root knot, is spread through the agency of the susceptible varieties of cowpeas. The cowpea wilt is not due to the same fungus which causes cotton wilt, but it is a factor in the rotations, and we are able to control it in the same way by the introduction of new resistant varieties of cowpeas.

The CHAIRMAN. Did you not do some work of the same character on watermelons down in South Carolina?

Dr. ORTON. Yes. While we have also succeeded in producing resistant varieties of watermelons, we have not made any effort to introduce those into commercial culture, for the reason that the quality of the variety is not maintained in all localities, and the commercial conditions do not seem to call for the substitution of a new variety at this time.

The CHAIRMAN. Are your wilt-resistant varieties as productive as the old kind?

Dr. ORTON. Oh, yes; fully so. The improved strains of our wilt-resistant cotton are in many ways superior to the common varieties.

We have no hesitation in recommending their cultivation wherever a standard Upland cotton is required.

The CHAIRMAN. I recall some years ago that you sent out to me, in my district, some wilt-resistant varieties of cotton, and the complaint was that the stalk grew very high and the bolls clustered. It was a kind of limbless cotton which the farmers did not like to deal with very much. Have you gotten away from that variety yet?

Dr. ORTON. Yes, sir; we have practically abandoned the culture of that and have a new and better one. In the early days, when we began our work, the demand for these resistant strains was very strong, and we allowed some to get out which we would now prefer to have put in the discard. We have accomplished very material improvements with the quality of the lint, productiveness, etc., within the last three or four years.

The CHAIRMAN. Take up your next line of work.

Dr. ORTON. Unless you wish, I will say nothing further regarding the cucumber.

The CHAIRMAN. I think that was pretty well brought to the attention of the committee the other day.

Dr. ORTON. The diseases of Irish potatoes constitute our largest project. In that work we have under way investigations, principally in the States of Maine, Wisconsin, Colorado, and Idaho, and have extended them in a minor degree to some of the other States, particularly in relation to the problems of the southern grower, who has to buy northern seed for planting purposes. We have been quite successful in bringing about the growing of a better type of seed potato. This work, however, has merely begun, and we look for greater results in the future.

Mr. LEE. How are you getting along with the troubles of the Irish potato? You said something about that last year.

Dr. ORTON. I think you refer to the powdery scab, a disease which was for a time under quarantine.

Mr. LEE. It came over from Canada, as I remember.

Dr. ORTON. Yes, sir. Investigations have been made during the past year in connection with powdery scab, but our fears which had been aroused by the character of its development in Maine have not been realized by its behavior in other States. We have found that this disease is limited to a remarkable extent by soil and climatic conditions; that in numerous instances where it has been carried accidentally or purposely into the South and planted, the resulting crops have been sound and healthy.

Mr. LEE. But you find it is necessary to maintain your quarantine?

Dr. ORTON. It has been thought unnecessary, and the quarantines have been withdrawn.

The CHAIRMAN. Your next item in your program is sweet-potato diseases.

Dr. ORTON. Sweet-potato diseases are under investigation and have been for three or four years, with very good results. The common diseases of the sweet potato—that is the black rot, foot root, and stem blight—have been brought under a large measure of control: or, to be more accurate, I would say that we have developed methods which, when applied, will permit the grower to control these diseases to a very satisfactory degree. Our problem now is

to get these methods into actual use, and for that purpose we propose making use of the county-agent organizations and the extension departments of the States.

These photographs [exhibiting] illustrate some of the common destructive sweet-potato diseases.

The CHAIRMAN. Is the rot in sweet potatoes caused by disease, or what causes that rot?

Dr. ORTON. They are diseases. This [producing photograph], I think, is the one you have in mind. This is the most common storage rot.

This, to a large extent, is a storage problem, and I was going to say that our work now is being directed more particularly to diseases which develop in storage. Some of those have their origin in the field, and we must begin in the field to control them. The others are being approached through the regulation of the storage conditions and through better methods of handling the potatoes.

The CHAIRMAN. Take up your next item.

Dr. ORTON. The malnutrition question is of considerable importance, and we are having the cooperation of the Office of Physiological and Fermentation Investigations in our investigations in the Norfolk section.

The CHAIRMAN. What do you mean by malnutrition?

Dr. ORTON. It is a type of disease which results from improper soil conditions.

The CHAIRMAN. They do not get enough food?

Dr. ORTON. Or too much of it, in most cases.

The CHAIRMAN. Too much; it gives them indigestion?

Dr. ORTON. Apparently so. We have yet to discover the exact nature of these diseases. They occur, to a large extent, in some of the intensive trucking districts where the culture is based upon the continuous use of large quantities of commercial fertilizers, with possibly not enough rotation, and green manures and stable manure. Some years ago we were able to relieve most of those troubles by a change in the system of manuring, but the nature of the spinach disease has not yet been solved.

The CHAIRMAN. Your next project is, "Breeding rust-resistant asparagus."

Dr. ORTON. That is one of our satisfactory experiments. Asparagus rust came from Europe in 1906 and threatened to wipe out our asparagus industry. When one of our pathologists was assigned to the problem of controlling it by breeding rust-resistant asparagus we felt that he was being put up against an almost hopeless task. He has, however, succeeded; and, as far as the method of control is concerned, we regard the asparagus-rust question as solved. From an industrial standpoint it is not yet solved, inasmuch as the new varieties have not yet been disseminated on an adequate scale to supply the growers. It is that phase of this project which we are now working.

The CHAIRMAN. How would you reach the growers with the information you have now gathered for them—through bulletins or through personal contact?

Dr. ORTON. We have, of course, published a bulletin on the matter, but we find that it is going to be necessary to make connections with asparagus specialists and to teach them our methods, so that they

will grow and supply all the seed that is needed in the country. The method of control is somewhat technical, inasmuch as it involves the growing of seed from selected plants and the crossing of those plants in a definite way. The seed resulting from these crosses produce plants possessing a high degree of rust resistance, with a larger stalk, greater productiveness, and general excellence, surpassing any grown in the ordinary way. It will doubtless be possible for a few men to grow for sale all of the asparagus seed that is needed.

The CHAIRMAN. You discussed the cucumber diseases. I do not presume it is necessary to speak about that unless you have some additional statement you care to make.

Dr. ORTON. Nothing further is necessary.

The CHAIRMAN. Your next, then, will be cabbage diseases.

Dr. ORTON. Here we have again the question of disease resistance. The diseases of cabbages which are most injurious are soil troubles similar to those already described as affecting cotton, cowpeas, etc.

The problem of breeding a disease-resistant cabbage was taken up in Wisconsin by Prof. Jones and results secured which fully equaled any of those secured by us in our cotton work. We have now undertaken to extend the work of breeding those types of resistant cabbage to other States. It will be necessary to breed up for each type of cabbage a resistant strain and to bring it into cultivation—to cultivate a kraut strain, a late winter cabbage, an early summer cabbage, and so on.

The CHAIRMAN. Take up your next item.

Dr. ORTON. The next project is nearly completed and has been practically suspended.

The CHAIRMAN. You say that item is completed?

Dr. ORTON. The "monograph of Fusarium" project is suspended on account of the absence of the investigator in charge.

The CHAIRMAN. All right; take up the next one.

Dr. ORTON. The nematode diseases of truck crops and cotton are of enormous importance. They possess a degree of significance, to the southern farmers in particular, which is nowhere realized. The parasite attacks the roots of the plants and works entirely out of sight, greatly reducing the yield. The same species of nematode attacks some hundreds of cultivated and wild plants, and it is going to be necessary, particularly in Florida and the warmer regions of the Gulf States, to change materially the system of farming and the varieties of crops planted in order to adjust ourselves to this class of parasites.

The problem might perhaps be referred to as a hookworm disease of plants, inasmuch as the parasites belong to the same group, and root knot is just as serious to the plant kingdom as hookworm is to man, and it occurs throughout the same geographical district.

Mr. HAWLEY. It is restricted, then, to a certain part of the country?

Dr. ORTON. It is more especially to be found in the warmer parts of the country, but sometimes extends pretty well north. Of course, it occurs in greenhouses throughout the whole country.

The CHAIRMAN. Is there any possible kinship between the hookworm affecting human beings and this disease?

Dr. ORTON. They are related parasites, but the root-knot nematode is not dangerous to man.

Mr. HAWLEY. How is it spread from one section to another?

Dr. ORTON. It is a disease of tropical origin, and is probably spread to a great extent by the distribution of nursery stock.

Mr. OVERMYER. There is a very large variety of nematode diseases?

Dr. ORTON. Yes; there are many species already known, but the root knot as an agricultural problem involves principally one species. There are a few other species which are of significance in special cases.

Mr. HAWLEY. How do you propose to solve the problem—by breeding resistant plants, or by some treatment of the soil?

Dr. ORTON. By the application of several methods. In the first place, by restricting the spread of the parasite as much as possible; in the second place, by a starving-out process through a rotation of crops, some crops being immune. Resistant varieties of susceptible crops have also been secured in some cases—in cowpeas, for example.

Mr. HAWLEY. How long will it remain in the soil?

Dr. ORTON. As long as susceptible crops are grown. In ground kept free of all vegetation for one year or rotated with immune crops for three years the nematodes may be expected to be eliminated by starvation.

Mr. HEFLIN. Doctor, what is the difference between the black root and cotton wilt?

Dr. ORTON. There is none.

Mr. HEFLIN. They are the same thing?

Dr. ORTON. Two names for the same disease.

Mr. HEFLIN. Have you said anything about a remedy for that?

Dr. ORTON. When I spoke of cotton wilt and our success in controlling it by breeding resistant varieties I had reference to what you call the "black root." That is well under control.

The CHAIRMAN. Take up your miscellaneous truck-crop diseases.

Dr. ORTON. Of those a great many are under investigation, but those which are most important may be limited to three or four. We have in the case of the tomato some very serious threatened troubles which we hope to work upon later on. In the case of the watermelon a new disease was discovered and worked out this year which causes heavy losses in the course of transit from the South to the North. This is a stem-end dry rot, due to a particular fungus, which apparently originates in the field. Its relation to the culture of the watermelon has yet to be discovered through work to be done in the South. At the present time we only know that cars arrive in the market with large percentages of the fruit decayed.

Mr. ANDERSON. That disease, then, does not make its appearance in the field?

Dr. ORTON. No; not unless the melons are kept there for some time after maturity.

The wilt-resistant watermelon to which reference has been made is pictured here in this photograph.

We have been interested in the work on anthracnose in beans which has been very prevalent in Michigan, New York, and other States during the past year. That is a control problem of considerable magnitude, as it involves the production and dissemination of disease-free seed. By that means it is probable that we are going to be able to control the disease; but at the present time very little

of such seed is being produced, and more support for that work would be very desirable.

Here are some pictures which you may find of interest, I have already referred to these diseases.

The CHAIRMAN. Take up your forage-crop diseases. That seems to be the next item.

Dr. ORTON. Forage-crop disease work is at present on a very small scale. It relates to some of the more serious troubles, such as the one pictured here, crown wart of alfalfa, which was recently introduced into this country, beginning in some of the Western States, and exciting considerable alarm among the pathologists. The parasite is related to that causing the wart disease in potatoes, against which a quarantine is enforced.

Mr. HAWLEY. Where did that disease which affects alfalfa come from?

Dr. ORTON. We have most of this in California.

Mr. HEFLIN. Where did it come from?

Dr. ORTON. That we do not know.

Mr. LEE. Is that the disease which broke out a year ago in Utah?

Mr. HOWELL. No; that trouble was caused by the alfalfa weevil.

The CHAIRMAN. How destructive is this disease?

Dr. ORTON. We have not had enough experience with this disease to be able to say. It is of a rather threatening nature. Of course, we have had only a few fields under observation and those for a relatively short time.

The CHAIRMAN. That seems to complete your line of work, but I notice that in your item here you have "drug and related plants."

Dr. ORTON. That is put in to cover miscellaneous work, especially the gingseng-disease work which we did some years ago, which is now practically completed.

Mr. HAUGEN. What results have you had?

Dr. ORTON. We have had satisfactory results. Most of the serious troubles of gingseng were worked out and their methods of control discovered.

Mr. HAUGEN. Is gingseng being produced in this country to any extent?

Dr. ORTON. Yes; to quite an extent. At the present time the gingseng market is quite depressed on account of war conditions, but there is a considerable gingseng industry. The growers are holding their crops and are awaiting better times now.

Mr. HAUGEN. In what States is it being produced?

Dr. ORTON. In a number of States—perhaps more largely in Michigan and New York than any others.

Mr. HELGESEN. And Wisconsin?

Dr. ORTON. And Wisconsin.

Mr. RUBEY. They are growing some also in my distdict in Missouri.

Mr. HAUGEN. Is it believed to be a profitable investment?

Dr. ORTON. I would be glad to have my colleague, Dr. Stockberger, answer those inquiries.

Mr. HAUGEN. You say it can be grown with success. Is it believed to be a profitable investment?

Dr. TAYLOR. In a small way. Dr. Stockberger, who has charge of the drug-plant work, is here and could discuss that a little later.

Mr. HAUGEN. I do not care to take up the time of the committee, except that I have had the question asked me a number of times.

The CHAIRMAN. Is there anything further?

Dr. ORTON. That is all.

STATEMENT OF MR. WALTER T. SWINGLE, PHYSIOLOGIST IN CHARGE OF CROP PHYSIOLOGY AND BREEDING INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. The next item in the Book of Estimates, No. 77, is "For investigating the physiology of crop plants and for testing and breeding varieties thereof." You seem to desire an increase of $5,000 there.

Dr. TAYLOR. Under this paragraph there is carried the line of work largely consisting of special breeding investigations, of which Mr. Swingle has charge. The increase of $5,000, as noted, is requested especially with reference to an attack upon the problem of breeding disease-resistant citrus varieties. Mr. Swingle is here and can present this work to you.

Mr. SWINGLE. I will say, Mr. Chairman, that the work authorized by this item is, as Dr. Taylor has stated, primarily the adjustment of special crops to extraordinary conditions of climate and soil or disease. In this connection I might, as an example, speak of the date palm.

The date palm has been grown in California probably for 150, and certainly 100 years, but it was never a success until, as a result of very thorough investigations as to the life-history requirements of the date palm, it was finally possible to predict with some certainty where it could be grown successfully. It was, furthermore, obvious after a study of the date palm that such experimentation must be done by the Government or by the States to avoid very heavy losses to the individual farmer. This is because the date palm, unlike the other fruit crops, can not be budded or grafted; and if, by any chance, the farmer should plant the wrong variety, he is condemned to failure, as there is no way of changing over the variety to a new one, without replanting. On this account, some 15 years ago Congress authorized rather liberal appropriations for the introduction of offshoots of new varieties of dates, and date gardens were established in the States of Arizona, California, and Texas where these varieties were tested. As a result, I am glad to say, we have now established in this country a very flourishing date industry, in which perhaps $125,000 is being invested annually, and a few hundred people are making it their principal business. Date culture promises to become a very profitable new fruit industry and one very useful to our country, as it can be carried on in certain regions where other crops fail.

Mr. HAWLEY. Is there enough area in the United States in which they can be grown to make it a large industry?

Mr. SWINGLE. No; it will be a special industry, and that is a thing which we are investigating so as to find out where we can grow the date.

The box which I have here in my hand is an example of the Deglet Noor, the best variety imported from the Sahara Desert,

which is now being grown successfully in southern California, where the climate and soil conditions are similar to those of southern Algeria and Tunis. There is apparently only one little locality of perhaps a few hundred square miles in the United States where it can be grown profitably on a commercial scale. And this date, I may say, sells in the markets, along with confectionery of the best sort, at from 50 to 65 cents a pound, retail. The wholesale price runs from 40 to 50 cents. In other words, this date is far superior to any other date on the market.

The CHAIRMAN. What would the acreage value of that plant be?

Mr. SWINGLE. You see, you plant the offshoots, which cost about $3 apiece. It will cost a dollar to plant them, which will make $4, and planting 50 trees to the acre would make $200 an acre net cost for stock. Then you have to wait five years for a full crop. So that the preliminary cost is considerable, and for this reason it was very important to make extensive experiments so as to be sure that no growers would be put to the expense of a failure; and I am glad to say there has been almost no loss on the part of individuals in the growing of dates so far.

The CHAIRMAN. What would be the yield per acre?

Mr. SWINGLE. I hesitate to say. The real estate men in California say I am the greatest enemy to California who ever lived, because I keep the profit per acre in hundreds of dollars while they say it is in the thousands. I, myself, could not say anything beyond the hundreds. It is like orange culture; it depends upon how successful the man is.

Mr. LEE. How many pounds could you raise to the acre?

Mr. SWINGLE. The trees yield from 100 to 200 pounds a year each, depending on the conditions of the soil, but that, of course, would be a prodigious yield, and you must remember that the dates which bring high prices are only the very choicest specimens. The yield of choice dates is, perhaps, not over one-quarter of the total crop.

Mr. HAUGEN. That would make an average of about $2,500 an acre?

Mr. SWINGLE. There is no doubt it runs up pretty high; so high I do not like to put it in figures.

Mr. STEELE. Oh, Haugen, it is like raising colts: you won't get one out of three that would be worth $200.

Mr. SWINGLE. I may say that the real estate men figure the net profits at $24,500.

Mr. HOWELL. Per acre?

Mr. SWINGLE. Yes; per acre. Where the date palm grows, it is one of the most striking objects in the world. This photograph is a view of an oasis in the Sahara Desert in southern Algeria, from which the dates now growing in this country are obtained. And I may say that we are far surpassing the Old World in the manner of production and quality of the article, and have accomplished in 15 years greater results than have been attained by the sleepy methods of the Arabs which they have followed for the last 2,000 years.

We are now breeding new varieties of dates. One of our co-operators has 20,000 seedlings of the choicest varieties, and hundreds of new varieties are now being produced in this country as good as those we import from abroad.

The CHAIRMAN. Is it your hope in time to supply the demand of the country for this product?

Mr. SWINGLE. Mr. Chairman, I would like to say that we import dates at an extraordinarily low price from the Persian Gulf region, or we have in times past. There is an area at the head of the Persian Gulf where dates are raised very cheaply, and dates from there are landed in New York City at a price of from 3 to 4 cents a pound wholesale. So it is very doubtful if we can ever produce dates to sell in New York City as cheaply as they can be imported from the Persian Gulf. But those, I may say, are only the second-class dates. We can produce far better dates than those.

Mr. HAWLEY. What is the name of the date you have in that large picture?

Mr. SWINGLE. That is the Deglet Noor variety. It is the one which brings the highest prices in Europe, and the one which is sold in the cities of the Pacific coast at confectionery prices. You can see for yourself the way they look [exhibiting a package of dates].

Mr. STEELE. Have you found any bugs that will destroy this plant?

Mr. SWINGLE. Yes; two very serious pests. [Laughter.] Let me tell you the rest of the story.

Mr. OVERMYER. Then, have you found something that will destroy the bugs?

Mr. SWINGLE. Yes; and these insects are being eradicated, and this, as far as I know, is one of the few successful experiments in the complete eradication of an insect pest. Through the cooperation of the Bureau of Entomology and the Federal Horticultural Board steps have been taken to protect the date growers, and within five years the insects will all have been eradicated. The date is not a widely cultivated tree, but is limited to small areas; that being the case, it was comparatively easy to kill out these pests.

The CHAIRMAN. Now, that is a very interesting statement. But you have overlooked to tell us about your Indian cooperation.

Mr. SWINGLE. Yes; I did not take that in order, for the reason that it covers field-station facilities for many of the investigations carried on by this office. I am able to use the facilities of the Indian Office on several southwestern reservations, where they have the pumping plants, irrigation ditches, blacksmith shops, and carpenter shops—in short, all the facilities for doing experimental agricultural work. So that we have conducted cooperative investigations with them. This item in the Program of Work refers primarily to work at Sacaton, on the Pima Indian Reservation in central Arizona.

I might say, Mr. Chairman, that this work, carried on in cooperation with the Indian Office, has also been cooperative inside of our bureau; that five different officers are concerned in the principal line of experimental work carried on there; that is, the introduction and successful establishment of Egyptian cotton culture. At least two other officers will explain the details of that work. But I may say, in passing, that the first full bale of Egyptian cotton grown in the United States—that is, grown with a reasonable hope of profit—was grown at Sacaton, Ariz. And the first commercial culture of Egyptian cotton has been carried out in the Salt River Valley nearby, where last year several thousand bales were produced.

Mr. HEFLIN. What is the difference between that cotton and what we call sea-island cotton?

Mr. SWINGLE. They are similar in type, but different in quality, the Egyptian cotton being a little browner, but a little stronger, perhaps, and harsher.

Mr. HEFLIN. And they are producing that now in Arizona?

Mr. SWINGLE. It is being produced in Arizona and it is imported on a very large scale, from $20,000,000 to $25,0000,000 worth a year being brought from Egypt. We are now attempting to produce it in this country. I may simply say that this cooperative work of the Indian Office has enabled us to secure a type of labor which has permitted the growing of this cotton successfully. In other words, by the application of scientific methods to this culture, we have been able to compete successfully with labor costing one-tenth of what we have to pay, and that, too, with no protection by tariff or advantage in freight rates.

Mr. HAWLEY. What price does this cotton bring as compared with ordinary cotton?

Mr. SWINGLE. About 10 cents more. It is now running from 23 to 25 cents for the choicest staples, and the crop we raised sold this year for from 22 to 23 cents per pound.

The CHAIRMAN. Take up your fig-culture work.

Mr. SWINGLE. The fig culture is a special line of work. Up to 1899 the Smyrna fig had not been produced successfully in the United States. In that year I brought the fig insect to this country and through the cooperation of the Bureau of Entomology this insect was established in California. The fig insect requires a special type of fig tree in which to live—the so-called caprifig—and it was found that our people did not have the right kinds of caprifigs in which to support this insect.

Mr. HELGESEN. This is a desirable insect, then?

Mr. SWINGLE. Yes, sir; this is a desirable insect, and no fewer than seven attempts to import them were made before they were finally established in the commercial fig orchards of California. Finally, through new methods of packing, I succeeded in getting it over to North America; and, once established in California and put in trees of the right sort, it has been able to thrive. The department maintains a small garden from which caprifigs are distributed all over the Southwest, wherever this type of fig can be grown at the actual cost of express to the grower. In connection with this work new and superior varieties of caprifigs and of the Smyrna figs themselves are being produced. And I might say that investigations of the Bureau of Plant Industry have shown that these caprified Smyrna figs carry very much better than other varieties and can be shipped successfully from California to the eastern United States. In 1898 our production was zero, while now it is something like 5,000 tons per year, and is steadily increasing. The work we are doing is in the nature of breeding better fig varieties and also the breeding and distributing of the best varieties of the caprifig in which this insect can support itself.

The CHAIRMAN. Take up your citrus-fruit breeding, for which you are asking an increase.

[illegible] has been under way for some time, and we have been primarily aimed at with reference to the production of [illegible] fruits. This is done by hybridizing [illegible] the orange which will grow as far north as Washington or Philadelphia with the sweet orange. But in the nineties a fruit was created which you see here in the drawing picture, which has been grown a great deal through the lemon belt of the South [illegible] for home use. It has no [illegible] the possibility of breeding a cold-resistant citrus fruit.

The Chairman. Is that your citrange?

Mr. Swingle. Yes, this is the citrange. As I say, it is of no commercial value, but hundreds of lawyers, doctors, and farmers through the South have grown them, and they write enthusiastic letters to me.

Mr. Hawley. Why doesn't it have a commercial value?

Mr. Swingle. It can not compete with the lime and the lemon. They are better fruits. But the fact that these citranges can be grown in your own yard, and the fact that you will have a fruit which is fresher than you can buy down at the grocery, has made these people very enthusiastic.

The next step was the breeding of a slightly more hardy lime which could be grown in the southern edge of the cotton belt for home use. I took the Mexican lime—you know the Mexican lime is very tender and is used in the drug stores at the soda-fountain stands—I took the Mexican lime, and I was able to hybridize that fruit some years ago with the kumquat, which is a very small orange that has no particular commercial value. The hybrid is a small and acid lime-like fruit and will mature in northern Florida and extreme southern Georgia. That is perhaps the first hardy citrus fruit which has been produced that has commercial possibilities.

Another fruit which has been produced is the tangelo, a cross between the tangerine orange and the grapefruit. This yields a fruit that looks like the orange and is of very high quality. I have here a couple of specimens of these tangelos so you can see how they look. They do not look much like the tangerine orange or the grapefruit, but when fully ripe they will look like oranges. These [exhibiting specimens] are two different varieties. One parent is the tangerine, or so-called "kid-glove orange," and the other is the common grapefruit. Some of these hybrid citrus fruits promise to show distinct resistance to some of the worst diseases. For instance, in the case of this limequat, one parent, the lime, is very susceptible to the citrus canker; and the kumquat, the other parent of this hybrid, is almost immune; and this gives us a fruit that is very like the lime in quality but very resistant to canker. And so we see the possibility of also making grapefruit hybrids that are not affected by the citrus canker. In the case of the disease known as scab, the same thing is true; and it is probable that we can breed up grapefruits which will show more or less resistance to scab.

Mr. Hawley. This cross here between the grapefruit and the orange, do you hope to make that a commercial proposition?

Mr. Swingle. It is now a commercial proposition. There are now perhaps 50 acres planted in Florida, and the plantations are being rapidly enlarged

Mr. HAWLEY. How will the price compare with the ordinary Florida orange?

Mr. SWINGLE. It now brings a good deal more, but I must say that only people who have sufficient self-restraint to wait for that fruit to ripen can market it successfully. That one [indicating] does not ripen until two months after it colors, and if it were shipped now it would kill any market. It is too sour.

The one on the left hand [indicating] is more like the common orange in appearance and color.

Mr. HEFLIN. Does it taste like the grapefruit?

Mr. SWINGLE. No; it tastes more like a very tender orange. It has also an aromatic taste like the tangerine, which is one parent, but not so strong.

Dr. TAYLOR. When it is ripe, is it good to eat?

Mr. SWINGLE. Oh, yes; it is good to eat when it is ripe.

Mr. HAWLEY. Will these come into the market after a sufficient period and be marketed with the ordinary orange, or will they have a separate market by themselves if they are held until they are fully ripe?

Mr. SWINGLE. Yes. If held until they are fully ripe, they are marketed later than common oranges.

Mr. HEFLIN. I have in northern Georgia a citrus tree which I got from the Government a few years ago that bears a fruit about the size of an English walnut. Is that a lime?

Mr. SWINGLE. No; that is one of the citranges. It is absolutely useless as a table fruit, and can only be used for ade. It makes excellent ade if you keep away the oil from the peel.

This [exhibiting fruit] is perhaps the earliest of all the tangelos.

Mr. HELGESEN. That is the same, only riper than the other?

Mr. SWINGLE. No; a different variety.

The CHAIRMAN. Suppose you take up dry-land arboriculture now.

Mr. SWINGLE. That is a project of local importance and is concerned primarily with finding suitable stocks on which to grow fruits in the drier parts of the West and Southwest. Only a comparatively small amount is being spent, mostly in preliminary experiments. Some wild species of plums have been found by my colleague, Prof. S. C. Mason. They are very distinct types and grow under dry-land conditions and form stocks which have been found to resist drouth and alkali, and therefore suitable for growing in dry or salty lands.

The CHAIRMAN. How do you propose to use this increase of $5,000 which is estimated for?

Mr. SWINGLE. I would consider it desirable to follow up the breeding of disease-resistant varieties of the grapefruit and also of the orange. The grapefruit is coming to be susceptible to the citrus scab. Twenty years ago, when the citrus scab, like the canker, came to this country from Japan, grapefruit was entirely immune, but to-day it is being attacked more and more. I have no doubt it will be possible to create a new grapefruit which will be quite immune to this disease. I am also sure that we can produce new varieties which are resistant or immune to the other common diseases.

The CHAIRMAN. And you would like to have one or two additional scientists for this work; is that the idea?

Mr. SWINGLE. I want to extend the work by using new material. I want especially to use oriental material. Let me explain the reason for saying that. This year I made a trip to the Orient, and I was able to make, in Japan, hybrids between our varieties of grapefruit and the canker-resistant pumelos of the Orient. There were no grapefruit in Japan, and the pollen from Florida grapefruit was placed in little tubes, exhausted like a barometer tube, and then sealed and shipped to Japan. It was used there successfully, and many hybrid seeds were obtained. Much of this work was done without any charge whatever by the local Japanese experimenters. This shows the possibility of quick work in crossing the citrous fruits of this country with the valuable disease-resistant varieties we know to exist in Japan and other oriental countries.

Mr. OVERMYER. The Japanese fruits are resistant, as I understand it?

Mr. SWINGLE. The scab and canker have both been there for many years, the canker having existed there for at least 15 years and the scab probably for centuries. I hope we shall be able to eliminate citrus canker from the United States, but I believe it is no more than the part of wisdom to breed canker-resistant varieties of the grapefruit, orange, lemon, and lime as a precautionary measure. I believe it can be done, because I have already bred a lime which seems to be almost completely canker resistant. I have found in the Orient three or four good-flavored pumelos which are more or less resistant to citrus canker.

The CHAIRMAN. Is there anything further you care to say to the committee?

Mr. SWINGLE. No, sir.

STATEMENT OF MR. KARL F. KELLERMAN, ASSISTANT CHIEF OF THE BUREAU OF PLANT INDUSTRY, AND PHYSIOLOGIST IN CHARGE OF SOIL-BACTERIOLOGY INVESTIGATIONS.

The CHAIRMAN. Dr. Taylor, take up item No. 78, "For soil-bacteriology and plant-nutrition investigations," and so on, $42,000. There seems to be no change in that item from the present bill.

Dr. TAYLOR. There is no change in this item for soil-bacteriology and plant-nutrition investigations. This work is administered by Dr. Kellerman, assistant chief of the bureau.

Mr. KELLERMAN. Mr. Chairman and members of the committee, there is no change in this item. It is planned to continue the work as it has been conducted during the past year. The most practical phase of the work is the production and distribution of cultures of bacteria for the inoculation of leguminous crops.

The CHAIRMAN. I see we are spending $11,415.79 for that.

Mr. KELLERMAN. Yes. This work, I believe, is more or less familiar to all the members of the committee. It is based on the fact that leguminous crops, such as clover, beans, peas, etc., grow their maximum crop when certain bacteria are present, on their roots; and in many sections of the country, especially where these crops are being used for the first time, these bacteria do not normally grow.

The work is comparatively simple at the present time. It is mainly laboratory routine but is being continued as perhaps the most satisfactory method for keeping commercial companies up to a satis-

factory standard. There are several commercial companies that are producing cultures, but the commercial cultures are not always entirely satisfactory to the farmers. By continuing the Federal distribution there is something for the companies continually to check against, and by distributing small quantities of these cultures free to the farmers in various parts of the country there is a continuous local pressure from all parts of the country for cultures of high quality. The department also has authority under this item to investigate the quality of commercial cultures and examine the laboratory facilities and the operation of the different companies. That is being interpreted as a cooperative rather than a regulatory feature. The intention of the department is to encourage the companies to produce good cultures and to show them how the cultures can be produced in a proper manner, rather than attempt to control them by court procedure.

The CHAIRMAN. Does any special act of Congress give you authority to procure these cultures in the open market, the regulation of their production, and so on?

Mr. KELLERMAN. That was inserted in the appropriation bill last year.

The CHAIRMAN. Yes; I remember it was put in there, but I was wondering whether we based it on some former legislation.

Mr. KELLERMAN. No; there was no former legislation. It is not permanent legislation, of course, and holds merely for the current year. It has been found to be satisfactory, and it is hoped that the same authority will be continued.

The CHAIRMAN. I think it is very desirable to continue it, but I am a little afraid that a point of order would lie strongly against that if it should be made.

Mr. HAUGEN. Have you discovered any new culture recently?

Mr. KELLERMAN. No; no new cultures have been discovered. In connection with the examination of commercial cultures of all sorts we have examined several cultures reported to be new; but we have found up to the present time no new cultures that would be satisfactory for stimulating the production of crops other than legumes, although there have been both popular and technical announcements of such alleged facts.

The CHAIRMAN. Take up your next group, "Soil bacteriology: A comprehensive study of the relation of soil bacteria to soil fertility and crop production."

Mr. KELLERMAN. That work, Mr. Chairman, is technical laboratory investigations, to a large degree, the purpose of the work being to develop, if possible, biological methods of determining and controlling the fertility of the soil. For example, we are trying to determine the fundamental questions of manuring. That work is in its infancy. While we have been able to make a few suggestions that seem to be of practical value, we estimate that it will be a term of years before we understand sufficiently what takes place in the soil when different types of manures are added for us to construct any fundamental theories of just what different symptoms in the soil may mean.

The CHAIRMAN. Your idea is to find out with a given soil what kind of fertilizer should be used for a given crop. Is that the theory of this item?

Mr. KELLERMAN. It is to find out what changes are produced in the microscopic living materials in the soil by the addition of different fertilizers or by the addition of crops that are turned under for green manuring.

The CHAIRMAN. With what practical point in view?

Mr. KELLERMAN. With the hope of determining more rational systems of manuring. For instance, there has been a practice followed in only a few localities. I am glad to say, of adding considerable quantities of nitrate fertilizers at the time that stable manure is added, or at the time green crops are turned under, the idea being that a quick stimulation of crop growth could be secured. We found from our bacteriological studies that this was theoretically wrong, and our field experiments have demonstrated that our theory is right, for under those conditions the effects of the nitrogen in the nitrate is largely lost—that is, given off to the air in the form of nitrogen gas—and, at the same time, the humus material in the soil, which we want to build up and maintain, is destroyed too rapidly. So that there is a positive disadvantage in applying the fertilizing material in that way.

Mr. HAWLEY. Do you do this work in cooperation with the Bureau of Soils?

Mr. KELLERMAN. No; this is essentially a biological study; it is essentially a bacteriological study, and it is not conducted in cooperation with any other organization.

Mr. HAUGEN. Has it been fully determined when and how to apply manure—how it can be applied to the best advantage?

Mr. KELLERMAN. No; it has not been fully determined.

Mr. HAUGEN. Has it been determined whether old manure, for instance, is of the same value as fresh manure from the barn?

Mr. KELLERMAN. There is a period in stable manure when it is at its maximum value. If it is put on fresher than at that period or very far beyond that period its effect on the crop is less valuable.

Mr. HAWLEY. What is that period?

Mr. KELLERMAN. That period varies with the temperature and moisture conditions of the manure. But under an ordinary spring or summer condition that period would be when the manure is approximately three weeks old.

Mr. HELGESEN. How to handle manure is, in our section of the country—North Dakota—a very vital question. Out there the men throw the manure out in a deep pile, and, because of the dry atmosphere there, it dries out and never rots and settles down. How to handle it in such a way as to get good practical results out of it no one has been able as yet to discover. I did accidentally make the discovery, however, that by putting the manure into a practically air-tight frame shed the moisture on the inside freezes in the winter time. The moisture rises and hangs down from the ceiling and falls back on the manure, and when spring comes all we have to do is to take a spade and dig it out like a chunk of cheese; but if put out in the open it will get entirely too dry, and sometimes it will burn and becomes absolutely worthless. I think some experimentation along that line would be of a great deal of value.

I presume down South they do not have that trouble, because they have a more moist atmosphere.

Mr. STEELE. I wonder how you would get this fellow out of his dilemma? Last spring a year he entered into a contract with the stockyards for their manure and made an arrangement with the railroad. The railroad hauled two cars of manure up to his place, about 7 miles, and he manured 40 acres very heavily. That was last spring a year. It was a dry year and he raised nothing. Last year he plowed again and sowed wheat, and the growth was so rank that it all fell down. Now, he has lost two crops by this agricultural idea that we ought to manure our land. He did it too hard, I suppose?

Mr. KELLERMAN. He did it too hard for wheat.

Mr. MCLAUGHLIN. Have you determined whether or not it is necessary to use manure to keep up the fertility of the soil?

Mr. KELLERMAN. That is a controversial subject. My opinion is that it can be overdone, and there certainly are some soils that can produce for a very long period without any manuring at all.

Mr. MCLAUGHLIN. Is it true that a farmer can get along without using any manure at all?

Mr. KELLERMAN. In some sections of the country I think so.

Mr. MCLAUGHLIN. Have you read any articles by Frank I. Mann, a large farmer in Illinois and a brother of the minority leader in the House—articles in which he says that he uses substitutes for manure and does not use manure at all; that manure is not necessary?

Mr. KELLERMAN. I have not read those particular articles.

Mr. MCLAUGHLIN. There is an article in the first issue this year of the Prairie Farmer, an agricultural publication, as you know, from Chicago, in which Mr. Mann gives his experiences. He says he has fields that have been used and cropped for 11 years without a particle of manure, and states that he has harvested 102 bushels of oats off of one field and on a small field has had 62 bushels of wheat and 75 or 80 bushels of corn. His idea is this: That an analysis of manure shows what plant food is in it—so many pounds of phosphates, so many pounds of potassium, and so on. Now, he buys that prosphate in the shape of raw rock phosphate, and he buys the potassium in its form (I do not know whether there is any particular form for it except potassium), and he supplies this to the land as it is needed; and he says he can do it very much more cheaply than he could supply manure, which contains the same amount of plant food. Mr. Mann says that these fields of which he speaks, one of 80 acres, have not had a particle of manure for 11 years, except such as has been dropped by animals, and that he has gotten excellent corn yields. He has cropped that field for 11 years, and he has followed that practice at a cost of $2 per acre per year. He does not advise against stock raising or the keeping of animals, but this article was written with the idea of showing that animal manure is not necessary at all; that the farmer can get along without it altogether; and that the question of whether or not a farmer shall go into the stock-raising branch of the industry or the grain-raising branch is a matter of taste.

And Dr. Hopkins, of the University of Illinois, evidently believes, with Mr. Mann, that rock phosphate and potassium, and so on, can be supplied in the raw state and that manure is not necessary, and

that the nitrogen does not have to be bought at all, but can be supplied in goodly quantities by the turning under of clover. In this connection he states that it is no necessary to turn under the clover until you have used all that is needed. He says that one crop of clover turned under would be enough.

Mr. [illegible]. For how long?

Mr. McCandless. Well, it a rotation once in four years. The article is very interesting indeed. I have thought some time, when we are speaking of agricultural subjects of the kind, of extending my remarks or reproducing that article so that Members can at least see it and it may reach the eyes of a great many who do not read the Yearly Farmer.

Mr. Hughes. Is it not a fact that commercial fertilizer exhausts the soil?

Mr. McCandless. Properly used, I do not think so, though it is possible to impair the soil with commercial fertilizer.

Mr. Hughes. If applied as indicated by Mr. McCandless, it is necessary to apply it every year because the crop exhausts the soil and you produce a good crop only by applying the fertilizer every year, and without applying it you are absolutely without a crop, or practically without a crop.

Mr. McCandless. That is very likely to be the case if an attempt is made to produce another crop next year. I believe, however, that it is a fact that in some regions a better standard of crops can be secured by the judicious use of commercial fertilizer than by depending entirely on the natural fertilizers; that is the same satisfactory condition of the soil can be reached in a shorter time and with less expense and without any injury to the soil. The tendency in the use of fertilizers I think has been in the past to decide that if the application of a small quantity of fertilizer made much difference in the product on a particular field it was a good thing to double the fertilizer the next year.

Mr. Hughes. I have been told by farmers in eastern Maryland that without the use of the commercial fertilizer practically no crop can be produced; that is, where they have been applying it for a number of years. I know there is a difference of opinion, and I would like to have the opinion of the department.

Mr. Kellerman. The same condition, however, would hold for some of the virgin land. There is much land on the Atlantic seaboard that is not especially productive in its natural condition; and a judicious use of fertilizers on such land is, I believe, economically sound followed with cover crops to keep the soil from getting refractory.

The Chairman. What would happen to you, Doctor, if you attempted to grow cotton, for instance, on some of the sandy soils of South Carolina and North Carolina if you did not use potash with it?

Mr. Kellerman. I do not believe you would continue to produce cotton.

Mr. Heflin. Mr. Haugen asked you about a man who used fertilizers year after year, and if he skipped a year he would not produce as well. The purpose of using the fertilizer is to add the plant food, is it not, that is required for the making of a crop?

Mr. KELLERMAN. Yes.

Mr. HEFLIN. And whenever it is used it is because the soil does not have the plant food necessary to produce a crop?

Mr. KELLERMAN. I think Mr. Haugen had an idea beyond that, though, that soils that have been continually fertilized and over-fertilized may not, if let alone, yield as well as virgin soils would.

Mr. HAUGEN. It has been tried out in Iowa by a few, and by applying commercial fertilizer they produce bumper crops; but if they cease to apply it, they simply produce a small crop. And the question is, with the farmers who have given it some study, whether it is practicable to apply commercial fertilizer.

The CHAIRMAN. Would these crops fall below the original yield, Mr. Haugen?

Mr. HAUGEN. Yes; that is what I am told.

Another question is, Does the bumper crop, a big crop, exhaust the soil more than a normal crop?

Mr. KELLERMAN. Yes; though soils differ in the rate of exhaustion.

Mr. RUBEY. Right along that line, some years ago I had out about 20 acres of tomatoes, and we fertilized those tomatoes and raised a good crop. In the fall that land was turned under and the next year planted in wheat, and the biggest crop of wheat I think I ever saw grew on that soil. We got the benefit of the fertilizer used the year before with the tomatoes and, of course, the vines that were turned under.

Mr. HEFLIN. It is possible to use too much nitrate of soda, is it not?

Mr. KELLERMAN. Yes.

Mr. HEFLIN. So that the land will not produce for a year or two?

Mr. KELLERMAN. Yes.

Mr. HEFLIN. I heard that, Mr. Haugen, down our way.

Mr. HAUGEN. I take it that that applies in the same way as with the manure about which we have been talking, that the use of too much manure will absolutely destroy the crop. An excessive use of either, I take it, would be injurious.

Mr. HELGESEN. You say a bumper crop will exhaust the soil faster than a normal crop. We have bumper crops frequently out in our State, and that has happened two years in succession in some sections there. We always discovered that whenever we had the right kind of climatic conditions we had the same results. It does not seem to me that the bumper crops exhaust the land, because any time we get the right kind of climatic conditions we get bumper crops again.

Now, we do not fertilize our lands at all, and some of that land has been under cultivation for from 40 to 50 years. They have never used any fertilizer, and if we get the right climatic conditions we have a bumper crop.

Mr. MCLAUGHLIN. Year after year?

Mr. HELGESEN. The same crop year after year, practically; that is, we vary from wheat to oats and barley; that is all.

Mr. HOWELL. Do you crop plant year after year or summer farm?

Mr. HELGESEN. We used to summer farm, but a great many find that is not necessary.

Mr. HAUGEN. I have land which I have cropped for 35 years on which I have not used a spade of manure except clover or legume plants.

The CHAIRMAN. This is all very interesting, but we have to move along. Dr. Kellerman, take up your next item. There is $9,000 for plant-nutrition investigations. I believe you have about covered that in your remarks, have you not?

Mr. KELLERMAN. There are several special investigations under way, but I have covered a representative example.

The CHAIRMAN. Very well; we are very much obliged to you.

STATEMENT OF DR. OSWALD SCHREINER, BIOCHEMIST IN CHARGE OF SOIL-FERTILITY INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. All right. Dr. Taylor, No. 79:

For soil-fertility investigations into organic causes of infertility and remedial measures, maintenance of productivity, properties, and composition of soil humus, and the transformation and formation of soil humus by soil organisms.

Dr. TAYLOR. The committee will recall that this is the item which was transferred to the Bureau of Plant Industry from the Bureau of Soils, under the act under which we are now operating, effective from the first of July, and the personnel was transferred with it. Dr. Schreiner, who had charge of the work in the Bureau of Soils prior to the transfer to the Bureau of Plant Industry, will discuss this.

The CHAIRMAN. Before Dr. Schreiner begins, let me make this inquiry: Is most of the money in these various items expended for people who are doing field work, or is a great deal of it expended for work in your laboratories in Washington in connection with your studies here?

Dr. TAYLOR. In this item?

The CHAIRMAN. In all of them. I just want a general statement.

Dr. TAYLOR. That varies a great deal. The work in soil bacteriology, item 78, which we have just been discussing, is very largely in the laboratories here, and 79 is also very largely in the laboratories here.

The CHAIRMAN. It depends upon the character of the work?

Dr. TAYLOR. Yes; and in some of these subappropriations about an even balance would be struck. In some of them it is largely field work, and in others it is largely laboratory work.

Dr. SCHREINER. Mr. Chairman and gentlemen of the committee, there is requested for this work an increase of $2,500. The increase is asked for work which is to be done in cooperation with the Office of Cotton and Truck Diseases in connection with investigations being conducted on the powdery scab of potatoes in Maine. It has been found through some preliminary work which has been under way and in Dr. Orton's investigations that there is a close connection between the prevalence of this scab and the soil conditions upon which potatoes are growing; that is, the disease develops more readily in one kind of soil than it does in another. The reasons for this are not well known, but it is quite obvious that such a condition does exist. The object in spending this limited amount of money is to send a man (it would be preferable to send two, but certainly one) up there to Maine in order to study in detail the soil conditions where the disease is most prevalent and where it is not prevalent with a view to pointing out a remedy, either in soil control or in a

recommendation to the farmers to avoid those soils in which the disease is prevalent. If that were done, there is some hope if not of completely eradicating the disease at least of controlling it in such measure that it will no longer be a menace to the farmers in Maine.

Mr. HAWLEY. Have you been able to confine that powdery scab to Maine?

Dr. SCHREINER. It is not confined to Maine, but has also been found in other States. It occurs in a part of New York State and has been found in some small measure in Florida and in one or two other States.

Mr. HAWLEY. They raise a great many potatoes in Colorado, around Greeley. Has it developed there?

Dr. SCHREINER. I do not know. Dr. Orton can perhaps tell you whether it has been found there.

Dr. TAYLOR. No.

Mr. STEELE. What kind of bulletin do you send to those farmers who live along the heavy-soil river bottoms where there is a good deal of gumbo? Have you made any investigations there? If you will notice, the people on all of these heavy gumbo lands have to buy their potatoes. They do not raise their own potatoes. As I understand it—I have a gumbo farm—they list their ground in the spring—the people who do raise their potatoes list their ground—and then plant potatoes; then they take their wet manure and cover them with that, and those people will raise plenty of potatoes without putting any soil on top, you understand. Those who plant them in the gumbo-bottom heavy soils will not raise any potatoes; that is, they will only have one or two little potatoes in a hill. That is due to the fact, I presume, that the soil seems to be so heavy?

Dr. SCHREINER. The soil is too heavy for proper potato culture.

Mr. STEELE. They can not expand.

Dr. SCHREINER. They can not push the soil aside, as it were.

Mr. STEELE. Do you have a survey of those kinds of soils, and do you issue a bulletin to those people telling them about any investigations along that line?

Dr. SCHREINER. There are some potato bulletins issued by the department which make it clear that such soils are too heavy for profitable potato culture.

Mr. STEELE. Has the department taken up that feature that I mention, with regard to these farmers who have discovered that with their own methods they can not succeed?

Dr. TAYLOR. I think not; though the general cultural question in regard to potatoes is covered in the farmers' bulletins. I think it would help, perhaps, if Dr. Schreiner would tell us something of what he is doing under this paragraph, if that is agreeable to the committee.

The CHAIRMAN. We would be glad to have you do that, please, sir.

Dr. SCHREINER. One of the main features of our work has been the study of the organic matter in the soil. It is to a very considerable extent the organic matter which makes soils so very different in their properties—so very different in their natures. The amount, kind, and quality of that organic matter influences soil fertility to a very marked degree, both the natural organic matter which occurs

in virgin soils and the organic matter which is added in the form of manure or other organic fertilizers or in the form of green crops plowed under.

When such organic matter gets into the rock material it makes the soil, and until it does you have no soil: you have merely rock powdered; you have merely sand, which does not lend itself, either physically or biologically, to the support of crops in their customary or best manner. The organic matter, therefore, is necessary. Now we have studied this organic matter a great deal in the past few years, and in the course of that study we have taken the organic matter out of the soil and studied it and analyzed it—taken it apart, separated it into its component parts, and studied those component parts separately, in order to see what effect they have on the life in the soil, or the properties of the soil, and on the crops that are growing on that soil.

To make a rather long story short, I will say that we have isolated 40 or more different organic compounds—definite chemical individuals—which make up in part the organic matter of the soil. I say "in part," because there are still a great many more which we have not yet separated out. The interesting part about these compounds is that when tested some of them are very beneficial to crops, promote growth, and can be used by the crop in its development. On the other hand, there are others which are distinctly harmful to the crop, poison the crop, and produce unfavorable physiological phenomena in the crops, which behave as if they were suffering from some disease, this condition being sometimes manifested by a yellowing of the leaves or by discolored roots, so that the power of the plant to absorb the nutrients in the soil is almost entirely lost. So we might speak of these organic substances distinctly as poisons that are generated in the soil. As the organic matter decays and decomposes, if it does not decompose the right way, if it does not decompose in the right direction, we will have various compounds which are poisonous. I will illustrate that best to you by saying that, if we had some grape juice—I assume I may mention that subject here [laughter]—and we allowed that to ferment in this room, it would under these temperature conditions, probably turn into vinegar, and perhaps not one of you would care to taste it. [Laughter.] But if allowed to ferment under the proper conditions, you all know what it would produce.

Mr. HAWLEY. I do not.

Dr. SCHREINER. You would get a more or less pleasing, stimulating substance. That, in a way, illustrates how the soil organic matter may be decomposed in one way under one condition and in another way under other conditions.

If you will revert to some of the questions you raised awhile ago in reference to the harmful effects of manure under some conditions when applied to the soil, I will say that that depends upon the kind of soil into which you introduce the manure and how it decomposes in that soil. A great deal also depends on the way the manure itself decomposes, even before it is put on to the soil.

We have, then, succeeded in isolating from this soil some of these compounds—definite compounds, some in the form of white crystals and some in the form of liquids, and possessing different chemical

rties; and these, when put into the soil, can poison the plants
ng in that soil.
ie of this work we did a few years ago, but we have gone a great
rther within the last year or two and have been able to obtain
f those harmful bodies in considerable quantities. They are pres-
the soils sometimes in very large quantities, but it is hard to get
ut, of course, in large amounts. Now, by treating some soils in
ld with those substances we have been able to see that in that
ey have poisoned the soils to such an extent that crops grown
n are very much decreased in yield. I think I can show you
one or two of these photographs [exhibiting]. The four rows
i side [indicating] were untreated with the substance, and the
ows on the other side have been treated with this harmful
bstance. This one shows the same thing, being simply with
r crop.
real interesting part, however, comes in the discovery that the
ers which we apply to soils aid in overcoming these harmful
ients. If we have a soil, for instance, which is harmful and
oducing a proper crop and we can apply the proper fertilizer,
rcome the effect which that substance is producing. We may
tirely eliminate its effect, but we certainly modify it to such
nt that we practically overcome the harmful effect. And the
ting feature is that the one substance is overcome by one kind
ilizer and the other is overcome by still another.
CANDLER. Hence, before applying any kind of fertilizer to
t is very necessary to know what kind of land it is?
SCHREINER. It is necessary to know what kind of land it is and
ider the kind of crop you wish to grow.
CANDLER. That is, you want to find the deficiency of that soil
pply that by the matter which you add to it.
SCHREINER. That, at least, explains why so frequently we get
result from a fertilizer on one soil and we get only a meager
on another. And that is why there is no universal fertilizer
e can recommend for all soils under all conditions. You see,
striking here at the root of the difficulty of why one man
successful fertilizer which another condemns. One man will
nend this type of phosphate and another will condemn it; one
commend liming and another will condemn it. That is not due,
rge extent, to the fact that there is a misunderstanding among
about what food the plant needs. We are fairly well agreed,
sult of our studies under controlled conditions, that plants re-
otash, phosphate, nitrogen, etc.; but when we begin to apply
iat, or the other, we meet with difficulties, and the fertilizers
act as we had reason to anticipate. The general law, in other
is interferred with, and it does not work out as nicely as it
work. I have just suggested an explanation as to the cause
t. When we get out these substances and make a study of
we can see why the one particular soil will respond more to
iate than another soil, although it may already have contained
i phosphatic minerals in its own composition.
; vanillin, one of the substances, as an illustration. Here [ex-
g photograph] is the effect of vanillin in a plot of soil, which
ites the difficulty quite well.

Here is the effect of another substance called salicylic aldehyde, the larger plants on this side being untreated and the smaller plants on the other side being the treated ones.

Now, this photograph shows the effect of vanillin in a field, the small plants being on the treated soil. This other photograph shows a soil that has the vanillin in it treated with sodium nitrate, and you see how nearly sodium nitrate has overcome the effect of the vanillin, the two sides being practically alike. I think perhaps it comes out fairly well on this little composite picture [exhibiting photograph], which shows the crops in another year side by side, so that they are more readily seen, with both substances. This is the soil treated with vanillin [indicating], and you notice here [indicating] that the sodium nitrate has virtually overcome the effect of the vanillin.

Mr. HOWELL. What plant is this?

Dr. SCHREINER. That is the cowpea plant in its younger stages of growth.

The CHAIRMAN. Now, Doctor, at what do you aim ultimately in your studies?

Dr. SCHREINER. The ultimate aim, of course, is to throw light upon the action of fertilizers, with a view to explaining their action and making their use more certain. As it is now, although we have an enormous fertilizer industry, as you know, and we use enormous quantities, for which the farmers pay in the total enormous prices, the use of fertilizers is not, strictly speaking, scientific. It is on a basis of being a pretty good thing to use, but it is uncertain in its effects.

The CHAIRMAN. You buy a sack of guano and judge its value by the strength of its smell usually, do you not? [Laughter.]

Dr. SCHREINER. That is true in some regions, certainly. Then, again, fertilizers are now being judged by the States on their analyses largely. But even then, although the anlysis may be correct, it still does not argue that it will prove effective on this land or on that land. The same fertilizer on different soils will produce entirely different results.

The CHAIRMAN. Just like medicine will produce different results sometimes on human beings?

Dr. SCHREINER. I had in mind speaking of them as patent medicines, but I hesitated to bring in that term in connection with fertilizers for fear of its misapplication.

Mr. STEELE. You are aiming to make, at the same time you arrive at those conclusions, a survey of all these lands for which different fertilizers are necessary and adaptable? That is, you take a soil from a particular farm over here and find out its chemical analysis, and then you do the same thing with a farm over there; is that the idea?

Dr. SCHREINER. Of course it would require too much detailed work to undertake to do it in that way.

Mr. STEELE. I mean that it is necessary for the farmer to know just what kind of fertilizer he should buy.

Dr. SCHREINER. Oh, yes.

Mr. STEELE. Then the object is to find that out and then to make these surveys so as to know what kind of fertilizer to apply?

Dr. SCHREINER. To a certain extent: yes, sir.

Mr. HEFLIN. The question this year is going to be, Where can we get the fertilizer—potash and phosphoric acid? They all come from Europe.

Mr. STEELE. The point I am driving at is this: If you have found out those details definitely, in order for the farmer to apply them he must know what kind of soil he has and what is necessary to make that a profitable and productive farm.

Dr. SCHREINER. If, as we have on many occasions found, he has some condition that is wrong—if his soil is fundamentally wrong—there is no use for him to try to use fertilizers, expensive fertilizers, until he has removed that condition. Suppose, for instance, his lands are lacking in drainage and his soil throughout the year or a good part of the year is too wet——

Mr. STEELE. Here is another thought that I had: These soils, perhaps, would be in counties; that is, you would take a whole county, and that would be one kind of a soil. You are leaving my mind with the idea that maybe 160 acres over here is of a certain kind, and then 160 acres not a mile away is of a different kind. My thought is that perhaps it would be in counties or States that you would find a particular soil.

Dr. SCHREINER. There are a great many different soils in the United States. There are some soil types which make up in a large measure the food-soil types, representing the larger part of our big agricultural propositions. Now, the ultimate object, if you will pardon me a moment, is to do this kind of work on those large, dominant soil types—to conduct on them fertilizer experiments, to study thoroughly how those fertilizers act on these soils and how they affect the crop growth of these soils, and then to carry over the information thus obtained to the rest of the county and the rest of the State.

Mr. STEELE. The further thought I had was this: You take the ocean beach here, for instance. For miles that would be of one type. Then, if you had a rocky range, a limestone range, with erosion, etc., down the hillside, that would be another type. Is that it?

Dr. SCHREINER. Yes.

Mr. HEFLIN. Doctor, what is the answer to that question of mine about fertilizers? Where are we going to get that potash?

Dr. SCHREINER. To be perfectly candid, what we can get in this country is a mere drop in the bucket; and it is simply a situation which the American farmer has to face this year.

Mr. HAUGEN. It can be produced in this country, can it not?

Dr. SCHREINER. To a small extent.

Mr. HAUGEN. I understood the Agricultural Department to say it could be produced in large quantities, if given proper encouragement.

Dr. SCHREINER. It would be a mere drop in the bucket to meet the situation this year.

Dr. TAYLOR. Our present facilities are entirely inadequate.

Dr. SCHREINER. Yes; the facilities are inadequate.

Mr. HEFLIN. The price heretofore has been about $8 to $10 a ton, has it not, for potash?

Dr. SCHREINER. Well, somewhat more than that, for the pure potash salts.

Mr. HEFLIN. And now it is $30 to $40 a ton: I mean in the fertilizer form.

Dr. SCHREINER. It is nearer $100 a ton for potash salts.

The CHAIRMAN. Mr. Heflin is talking about potash fertilizer.

Dr. SCHREINER. In mixed fertilizer?

Mr. HEFLIN. It used to sell at $19 a ton and now it sells for $40.

Dr. SCHREINER. You can not get the potash salts under prevailing conditions.

The CHAIRMAN. I will say that the Senate passed a resolution the other day asking the Secretary of Agriculture to report to the Senate all the facts concerning the fertilizer situation. I understand that report will be sent in in a few days.

Mr. HOWELL. In counties where you have made a soil survey, if the farmers living in the county should want to ask you about the proper kind of commercial fertilizer to be used in that region where the soil survey has been made, could you give them any valuable information?

Dr. SCHREINER. Not necessarily. The survey accomplishes something that is different from this matter of fertilizer requirements. The soil survey is made by the Bureau of Soils and consists of a mapping of the kinds and types of soils. That will come before the committee when that bureau reports. It is separate from the question of the fertilizer requirements of that soil. That is something which we would either know from previous experience or by experimenting with the soil.

Mr. HOWELL. So the fact that a county has had a soil survey would not help the farmers in obtaining information as to what kind of fertilizer is best adapted for that section?

Dr. SCHREINER. Only to a limited degree. That is a different type of investigation.

Mr. OVERMYER. It is possible, Doctor, to have soil on a 160-acre farm which would have different requirements? I mean, is it possible to have varieties of soil on a farm of that size which require different fertilizer treatment?

Dr. SCHREINER. That is true; yes.

Mr. OVERMYER. A man might have a 100-acre farm, and his soil requirements would be such that he would have to use various kinds of fertilizers?

Dr. SCHREINER. That might be the case, but our large farms are usually looked on as rather distinctive soil types, for which the fertilizer requirements could be worked out.

Mr. HAUGEN. Mr. Chairman, I would like to ask the doctor a question: What can you tell us about peat and how to make it into soil?

Dr. SCHREINER. We are now doing some scientific work in the study of peat and muck deposits. Peat and muck are usually quite rich in nitrogen; it is a very beneficial substance for plant growth, but is in such form that it is not always accessible to the plant. It is tied up, as it were---not available. The fresh peat land, of course, has first to be drained, and then it gradually weathers. It is frequently acid, but through the action of weathering the acidity decreases. That can be helped some by liming, of course, and in that way the peat can be changed into an agricultural soil.

Mr. HAUGEN. How do you treat it? What do you suggest? First drain it, what next?

Dr. SCHREINER. Then, if it is acid, it should also be limed.

Mr. HAUGEN. It has to be made into a soil, as I understand it?

Dr. SCHREINER. It is made into soil by growing crops on it and working it. That is one method.

Mr. HAUGEN. What crops do you suggest?

Dr. SCHREINER. That depends on the location of the peat and its character.

Mr. HAUGEN. Take an ordinary peat that is from 3 to 7 feet deep.

Dr. SCHREINER. Peat can be used for a great many crops. It can be used for celery and most of the truck crops.

Mr. HAUGEN. Now, take a wheat-growing country or a corn-growing country?

Dr. SCHREINER. It is not well suited for wheat, as a rule.

Mr. HAUGEN. Is it for any grain crop?

Dr. SCHREINER. A grain crop is apt to lodge on peat soils. Corn, on the other hand, grows often very well.

Mr. HAUGEN. I believe the practice in Illinois, for instance, where they have been experimenting a great deal, is first to turn it over and then seed it to grass for a number of years and form a sod of the soil.

Dr. SCHREINER. Yes.

Mr. HAUGEN. Is that a good idea?

Dr. SCHREINER. That is a good practice.

Mr. HAUGEN. You do not recommend cropping that first?

Dr. SCHREINER. No.

Mr. HAUGEN. How many years would it take to make it into a soil of sufficient depth to grow a crop?

Dr. SCHREINER. It never turns into a soil, strictly speaking. It depends on the amount of mineral matter there is in it. Ultimately it might be turned into what might be termed "soil," but that varies from one peat deposit to another and with the amount of mineral matter which is mixed with the peat. You see, peat is largely organic matter that has decomposed somewhat. And, then, if there is mineral matter in the peat, it gradually disintegrates and becomes a soil.

The CHAIRMAN. Are there any further questions, gentlemen? Is there anything further, Dr. Schreiner, on that?

Dr. SCHREINER. I have not finished on all the scientific phases of the work, but I think I have covered them sufficiently to give you an idea of the work.

The CHAIRMAN. Very well; we are very much obliged to you.

(Thereupon, at 4.55 o'clock p. m., the committee took a recess until to-morrow, January 21, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Friday, January 21, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

STATEMENT OF MR. ORATOR F. COOK, BIONOMIST IN CHARGE OF CROP-ACCLIMATIZATION INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, we will take up this morning item No. 80, "For acclimatization and adaptation investigations of cotton, corn, and other crops introduced from tropical regions, and for the improvement of cotton by cultural methods, breeding, and selection, $42,580," which seems to be an increase of $5,000.

Dr. TAYLOR. Mr. Chairman, this is the item under which our principal cotton acclimatization and breeding projects are carried, as well as the work of a similar nature upon corn and upon certain other minor crops, and the increase requested is especially for the further projection of a new method of cotton culture which has been developed in this work. Mr. Cook, who has charge of all these projects under this item, is here and could discuss them.

The CHAIRMAN. Before that, Doctor, let me inquire whether you have ever considered the proposition of combining all of the cotton work in the Department of Agriculture under one supervision?

Dr. TAYLOR. Yes, sir; that has frequently come up, not only in connection with cotton, but with wheat and the other staples, and the general conclusion that has been reached each time that it has been considered is that these great staples require consideration from such different angles, involving such different types of work, that more effective work is accomplished through an association of the type of worker and the type of work than through an association with the crop in general. That is really fundamental in the organization of the department's work. Certain work on the grains, for example, is being done in three or four laboratories and offices of the Bureau of Plant Industry, one or two of the Bureau of Chemistry, perhaps also in the Office of Markets, and possibly in some other bureau.

The CHAIRMAN. You think, then, Doctor, that this, what might be called decentralized method of handling the situation, does not affect the effectiveness of the work at all?

Dr. TAYLOR. Not if the work is effectually correlated, so that it not [illegible]lve harmful duplication of interference.

The CHAIRMAN. I asked the question because a suggestion has come to me within the last few days that this work might properly and profitably be concentrated.

All right, Dr. Cook.

Mr. COOK. The increase in the appropriation is asked, as Dr. Taylor has stated, on the basis of a new method of cotton culture that has been developed. At the same time we have perhaps two other features that should be thought of in that same connection—namely, that we have found superior varieties of cotton, better than any we knew of before, and we have methods of selection that are necessary to preserve superior varieties from deterioration, which has been the difficulty with all the cotton culture in the past.

The history of cotton culture in the United States, as in other countries, is one of the frequent introduction of new varieties shown to be superior to those that were in use, and then, in a few years, some other variety comes in and takes the place of this one that a few years before was considered superior. Of course, we have to consider that we may have actually better things, but there is also a large element in this superiority of these new types that is undoubtedly the result of the fact that they are new, in the sense that they have been derived recently from single individuals. In other words, the new stocks are usually in better condition from the standpoint of selection.

These three applications of better varieties of cotton, better methods of selection, and better cultural methods, have been reached by the study of the cotton problems from the different standpoints that are stated under these different projects.

The CHAIRMAN. I wonder if you can not discuss that matter from the standpoint of your projects here.

Mr. COOK. Yes, sir; the development of the work is outlined in the statements that accompany the projects. The acclimatization of weevil-resisting varieties of cotton began 11 years ago with the discovery in Central America of the fact that cotton culture was regularly carried on by the Indians in the presence of the boll weevil. That was still in the early days of the weevil invasion, about the time when the boll weevil had made its most striking appearance in Texas. During a visit to Guatemala for the study of coffee culture we discovered the fact that cotton culture was regularly practiced by the Indians in a region where the boll weevil was abundant and appeared to be a native insect.

The investigation began on that basis, to see whether that type of cotton could be grown in the United States. It was found to have certain characteristics that enabled it to exist better and to produce better under the conditions of weevil infestation, and the investigations of the possibilities of securing other varieties with such characteristics were also begun. As the result of looking at the subject from this point of view and of extending those explorations into other parts of Central America and Mexico we have a series of new types of cotton that were grown in weevil-infested regions and had other desirable characteristics—that is, characteristics that we here, in the United States, would recognize as desirable, such as large bolls, combined with long and abundant lint—and that they had such characteristics in a larger measure than any of the varieties that were formerly known in the United States.

The CHAIRMAN. Doctor, as I recall it, you began the distribution this past year of a cotton known as Durango cotton.

Mr. COOK. Yes.

The CHAIRMAN. From the reports I have from it down home, it seems to be a very desirable cotton. Is it your idea that that type of cotton is more resistant to the boll weevil than the ordinary type?

Mr. COOK. That type of cotton has habits of growth that allow it to be handled culturally in certain ways; that is, it has a strong central stalk and is an early and very prolific variety. It is able to put on a large crop in a short period of time. That is the chief advantage that the Durango cotton has with reference to the boll-weevil problem.

The CHAIRMAN. I saw that cotton growing at a point in my district alongside of the old-fashioned cotton down there, and it struck me that it fruited very much better and more rapidly and it did not have quite such big leaves; is that true?

Mr. COOK. Yes; it has not only smaller leaves but a more open habit of growth, and that also is probably an advantage, not only in connection with certain damp-weather diseases but in relation to the weevil. The exposure of the ground underneath the plants is a recognized factor in the productivity of the plants, since it allows the weevil-infested buds to dry on the ground so that the weevil larvæ are killed. We have compared the Durango with the Columbia, which is a very fine variety in the Southeastern States, and we have found the Durango distinctly earlier than the Columbia and also better on account of having the more open foliage. The difference was very striking in some of the experiments in the Imperial Valley in southern California. The Durango cotton produced a good crop, whereas the Columbia produced almost nothing: the reason being that the Columbia was of a more luxuriant habit of growth, so that there was no development or very little development of the bolls underneath the heavy foliage. And everybody who is familiar with cotton knows that as soon as you get cotton plants up to a certain size or degree of luxuriance the chances of a good crop begin to decline, in comparison with other fields where the plants are smaller and more open.

The CHAIRMAN. Are you hoping in the process of breeding to get a type of cotton that will be fully resistant to the boll weevil?

Mr. COOK. No; I do not think there is any hope of a type that can not be injured at all by the weevils. We have types of cotton with characters that give more or less protection against the weevils; for instance, the Kekchi cotton, the first one that we studied from this point of view. We believe that cotton has a large degree of weevil resistance in two special features. In the first place, the squares or bracts that inclose the young bolls are very large and distinctly closed, with the edges pressed together and covered with hairs that impede the movements of the weevils. We have watched, many times, the weevil crawling over these closed hairy squares trying to get into them, and, being unable to do so, fly away. Another habit of this cotton is that of fruiting lower down than the other varieties. The lower fruiting branches are usually well developed, long and drooping. The result is as though the plant had developed a plan of deceiving the weevil, which seems to have the instinct

of always crawling upward when it alights on a cotton plant; because it wants to reach the buds. As a result of this habit of growth of the Kekchi cotton, with its drooping branches, the weevil may be led to crawl the wrong way. In any event, the buds and bolls of these drooping branches are but little attacked by the weevils. In experiments in Texas under severe conditions of weevil infestation, some of these plants with drooping branches bore, on the average, about 60 bolls, whereas plants of several other varieties bore much fewer bolls—often only 15 or 20 bolls—and the bolls were not attacked on the drooping branches. The trouble in Texas was that the drooping branches allowed the cotton to come down to the ground, where it was badly injured in dusty or wet weather. So we did not feel it was wise to attempt to introduce this cotton into general cultivation in Texas. But in Tennessee the Kekchi cotton has been raised on a field basis and behaves as a very early, prolific variety, with large bolls and long staple. The Kekchi cotton is raised, curiously enough, in the wintertime in Guatemala. The spring season is the only period of dry weather when they could harvest a crop, so that they are obliged to plant their cotton in October and November. The land has to be cleared by hand, for the weather is too wet to burn the brush, as is always done for corn planting in the spring. Now, this cotton is raised in the winter and grows at low temperatures, and we realize that it might be possible, although coming from a tropical country, to introduce it to the northern districts of our cotton belt. We have done so with excellent results in Tennessee, where we have been raising this cotton on a field basis; and the question now is as to whether it has any disqualification. It seems to be a little hard to start in the spring; that is the only difficulty we know about it now. It is an early cotton, with fairly large bolls and with excellent lint.

Mr. HAWLEY. How long are these fibers?

Mr. COOK. From 1 1/16 to 1 1/4.

Mr. HAWLEY. An inch and a sixteenth?

Mr. COOK. From an inch and a sixteenth to an inch and a quarter.

The CHAIRMAN. It is really a long-staple cotton?

Mr. COOK. It is a long-staple cotton, it is very hardy and very productive, and we have had some beautiful fields of it in Tennessee. The question in that case is whether it is well adapted to the local needs and methods of cultivation. Now that it is being grown on a field basis, we have the opportunity to test it culturally as well as from the standpoint of its special characteristics.

The CHAIRMAN. As I understand your work with reference to the boll-weevil situation, it is to develop a type of cotton that matures very rapidly and yet that is not too luxuriant in growth, and to keep it up with your cultural methods. I wish you would explain that a little later on.

Mr. COOK. Yes, sir.

The CHAIRMAN. I think that is the next item.

Mr. COOK. Yes. There is one more type of cotton here that has larger bolls. That is a type of cotton that has larger bolls than any cotton that has been under cultivation in the United States, and it has a lint that is 1 3/16 to 1 1/4 inches in length—a combination of characteristics which nobody imagined to be possible.

The CHAIRMAN. What is the name of that cotton?

Mr. COOK. It came from southern Mexico and we call it Tuxtla cotton, after the name of the place where it came from.

The CHAIRMAN. Why don't you get some American names for these cottons so we can pronounce them?

Mr. COOK. We have thought about that, but the foreign names have seemed to aid in interesting the public in the new types.

Mr. HAWLEY. In this boll-weevil problem you are endeavoring to get a cotton that matures its bolls to such a degree that it will be resistant to the weevil when he appears? The question I want to ask, now, is this: If that is the case and you succeed, do you fear that the weevil will adapt itself to that condition and appear earlier in the season?

Mr. COOK. No; we do not anticipate there would be any serious change in that respect, but that is a question. In considering the amount of injury the weevil can do in a field of cotton it seems to be a general fact that to have weevils abundant enough to seriously injure the cotton they must be bred, to a very large extent, in that same field. And if the cotton can be handled so as not to lose any time after it begins to fruit, there is a good chance of getting a crop under any weevil condition. All these experiments have been carried on in Texas under weevil conditions.

Mr. HELGESEN. Is there any way of destroying the boll-weevil at all?

Mr. COOK. We know of no way.

Mr. HELGESEN. The only way to combat it is by the cultural method?

Mr. COOK. Yes; the chief thing is to avoid injury by cultural methods, by having varieties of cotton that will fruit promptly and produce a crop in a short season, and to handle these varieties by cultural methods that will permit them to fruit rapidly.

The CHAIRMAN. In other words, your policy is to minimize the loss?

Mr. COOK. To minimize the loss by improving cultural methods and by using superior varieties to make good the loss which the weevil may continue to inflict in unfavorable seasons.

The CHAIRMAN. Take up your next item, if you please. "cultural factors under weevil conditions," and tell us about that briefly.

Mr. COOK. The question of cultural factors under weevil conditions is interesting from the general standpoint as an application of a strictly botanical fact to an agricultural problem. The fact in this case is that the cotton plant has two distinct kinds of branches. There is one kind of branch that corresponds to the main stalk of the plant, and another kind that produces the flowers and the fruit. Now, the main stalk of the plant never produces any cotton itself. Fruit is borne only on branches. At the base, near the ground, the main stalk sends out large, upright vegetative branches, and farther up it produces the fruiting branches; it puts out horizontal, or lateral branches they are sometimes called, which produce flowers and fruit. The practical point is that the vegetative branches—that is, the large upright branches—which represent additional main stalks of the plant, are not desirable for agricultural purposes. They are undesirable in two ways. In the first place, they can not produce cotton as early as the main stalk. Since they have to develop from the base of the main stalk they can not possibly produce cot-

ton as early as the lower fruiting branches of the main stalk. In the second place, when these vegetative branches develop in any numbers they interfere with the development of the fruiting branches at the base of the main stalk, so that, if you have a large plant with numerous vegetative branches, you can not possibly get an early crop of cotton. The object of this new method is simply to eliminate these vegetative branches—that is, these additional main stalks—so that the plants will have only one main stalk, with the horizontal fruiting branches coming out all along the sides of this main stalk, as may be seen from these photographs [exhibiting].

The CHAIRMAN. That is what you call your single-stalk method?

Mr. COOK. The single-stalk method; yes, sir. As to upland cotton, it takes this form [indicating on photograph]. On the left hand we have cotton growing as is more or less customary in the South. It is spaced perhaps more widely than is done in some districts, but generally in the South it is considered necessary to thus space cotton so as to get bushy, broad, well-developed plants. Now, under these conditions we have very good, well-behaved plants [exhibiting photograph]. In alternate rows with those plants we used our other method of thinning—that is, we left these rows longer in the young stages, without thinning, and then did not pull out as many of the plants [exhibiting photograph].

The CHAIRMAN. In other words, you plant them thicker in the drills?

Mr. COOK. We plant them thick in the drills and on account of thinning later we are protected from the development of a large number of vegetative branches which would make them crowded in the rows. In other words, by leaving these plants closer in the rows we usually have fewer stalks in the rows than result from the other method where each plant has several stalks or vegetative branches. The new system, with the plants close together in the rows, strikes many people unfavorably at first, until they understand that the branches can be controlled and injurious crowding avoided. Wider spacing has been urged in the past as the only way to avoid crowding, but it tends to produce large plants that fruit later in the season and are more exposed to the attacks of the boll weevil. The difficulty with the new system is that the habits of the plants and the effects of thinning at different times need to be well understood. Intelligent application is required in order to get the highest yields by the new system, under different conditions and with different varieties. The system can be overdone by thinning too late or by leaving the plants too close together for the variety or the conditions. As no general, invariable rules can be given, farmers are urged to learn how to use the system under their local conditions before attempting to apply it on a large scale. The system has been described and illustrated in several reports that have been published on this special subject.

The CHAIRMAN. What would be the difference, if any, in the yield of those two plants?

Mr. COOK. In this case the difference between the rows was about 53 per cent.

The CHAIRMAN. In favor of the single-stalk method?

Mr. COOK. In favor of the single stalks. We have another case, illustrated here [exhibiting photograph], in which we had differ-

ences that ran over 100 per cent; that is, the increase was over 100 per cent in the yield. Now, we are not assuming these differences will always be secured, and we do not want to assure anybody that they are going to get regularly any such differences. These are extreme cases, but the differences are significant as showing what the effect of our system is under extreme conditions of short seasons; that is, the shorter the season of fruiting, the greater the advantage of this system will appear, of course.

The CHAIRMAN. I take it that that experiment was made under boll-weevil conditions?

Mr. COOK. Under boll-weevil conditions; certainly.

The CHAIRMAN. And the difference of the yield in favor of the single-stalk proposition held also under normal conditions?

Mr. COOK. Oh, yes. This first one shown was not under boll-weevil conditions; that field was near Norfolk, Va., which is considered the northern limit for cotton cultivation. This Durango cotton, handled in this way, has now given for three years at the rate of about a bale per acre at Norfolk, Va. We thought that in trying this cotton there we were growing it under extreme conditions which would show what would be possible at any point further south. Where the season is shortened, whether by the boll weevil or because of the natural shortness of the season in the northern latitudes, there can be no question that this method of handling gives a great advantage in favor of larger yields.

The CHAIRMAN. Have you tried that method in South Carolina or Georgia?

Mr. COOK. Yes; we have had excellent results from it in South Carolina as well as in Louisiana and other States.

Mr. HELGESEN. Does the boll weevil affect all cotton crops in all States?

Mr. COOK. It has reached as far as Georgia.

Mr. HELGESENS. It has reached Georgia from the south, you mean?

Mr. COOK. Yes; coming in from the west. With reference to the single-stalk culture, I might say that there are many incidental advantages of this method. It makes the cotton stand up better, and it can be picked easier; it also avoids the danger of falling on the ground.

This [exhibiting photograph] shows a series of experiments tried in San Antonio, under weevil conditions. The piles of cotton at the end of the rows were brought up and piled on the ground in sequence and those photographs were taken. The weights given under each of those piles and the differences are quite consistent.

Mr. HAWLEY. The larger piles are from the single-stalk cotton?

Mr. COOK. The larger piles are, in all cases, from the single-stalk rows. In this case, the season of setting the crop was extremely short—less than 30 days; not a full month of fruiting period. In other words, all the crop had to be put on within less than 30 days.

Dr. TAYLOR. Why?

Mr. COOK. Because of the weevils and drought. The other cotton had very little opportunity to fruit, so that the single-stalk rows appeared to great advantage. Going on to the problem of establishing new varieties, the method of selection may be illustrated in this way. In this photograph [exhibiting] we have a long-staple cotton that is being developed in northeastern Texas with a

o maintaining the production of long-staple cotton under conditions. In this instance the cotton was selected from an ck; not introduced from abroad. In this row [indicating] e combed the lint from the individual plants of the selected On this side [indicating] we have the combed lint from indiplants, taken as they came in a row of cotton raised from ed stock, the ordinary commercial seed, of this same type. ll notice the irregularity of the individual combings repre- the two stocks. Those short combings represent waste in cess of manufacture. This cotton, of uniform length, is nuch more than cotton with an intermixture of short staple, as to be combed out or else remains in the cotton as an undelement, injuring its value to the manufacturer.

CHAIRMAN. In looking at this picture which Gov. Rubey is hand, it seems that this cotton of the single-stalk method nly; about halfway up the stalk. Is that due to the boll

OOK. That was due to the boll weevil and to the short season; happened after a certain time in either the single-stalk rows ther. Yes; that was the result of the boll weevil.

CHAIRMAN. You suspect that other to to be the result of the vil, also?

OOK. Oh, yes; there was a heavy infestation of boll weevils. r words, had not this cotton fruited low down the plants ot have had any fruit.

CHAIRMAN. In other words, you outrun the boll weevil?

OOK. We beat him.

HELGESEN. Is this the only appropriation you have for work oll weevil?

OOK. That is the only investigation of the problem in the of Plant Industry. The Bureau of Entomology has an inion on the subject. But this investigation of cultural facw we can breed superior varieties and handle the crop under vil conditions so as to minimize the injury from the boll is the only one we have.

ht say that this same system was applied in Arizona to Egyptton before we tried it in the boll-weevil regions. There the was to avoid the large plants that were not suitable for rposes. They were either not so productive as smaller plants o large that they could not be picked readily.

CHAIRMAN. Your next project is "Cultural factors in arid " which seems to be a small item. Just what are you pro- o do there?

OOK. That represents an extension of these new varieties southwestern country. There is a region out there where weevil has not penetrated and perhaps will be unable to live. eans of increasing the resources for those regions and as a of developing the production of some of the better kinds of experiments have been conducted in that part of the country. ults have been very satisfactory, especially in the Imperial of California, where the newspapers now state that 80,000 e to be planted next year, much of it the long-staple Durango The last crop was about 5,000 acres. The next is likely to be cres or more.

The CHAIRMAN. I believe your Durango cotton has sold for from 22 to 23 cents a pound?

Mr. COOK. Some of it sold for nearly 20 cents this year; most of it from 15 to 18 cents.

Mr. HOWELL. Are you now growing that in the eastern country—in northern Georgia, for instance?

Mr. COOK. Yes; it is being grown there in an experimental way. We have had good results in the East at several points from Norfolk, Va., down to South Carolina and in Alabama. About 200 acres were raised in each of these States in the season of 1915.

The CHAIRMAN. Have you ever investigated a famous cotton that has recently been discovered at Bishopville, S. C.? I saw it this year. It is a cotton from which they said they took one lock and strung it out, without breaking, until it reached 9 feet.

Mr. COOK. Nine feet?

The CHAIRMAN. I never saw anything like it. It is growing side by side with your Durango cotton. It is a wonderful cotton. I do not know whether it will stay to type or not; but if it does, it is certainly wonderful. I think Mr. Bishop sells the seed at 25 cents apiece, and one stalk yields $7 or $8 worth of seed.

Mr. COOK. We will be very much interested in getting some of that.

Mr. HAWLEY. Have you any money for it?

Mr. COOK. We would need a good deal of money, of course, to buy a bushel of seed at that rate.

Mr. HEFLIN. What cotton do you recommend? Did you say what cotton would grow best under boll-weevil conditions?

Mr. COOK. For Texas we recommend the Lone Star variety. For Tennessee our Trice cotton is the one we have done the most work with, and we know it has a very good chance under those conditions. So if it is not a question of staple cotton, I recommend these. They are two short-staple cottons that have given excellent results. The Trice variety was developed in Tennessee and has done well across the northern rim of the cotton belt. And some of the other short-staple varieties have given good results.

Mr. HEFLIN. This Durango is a long-staple cotton?

Mr. COOK. One inch and an eighth to one inch and a quarter.

Mr. HEFLIN. And it can be ginned in the old-fashioned way?

Mr. COOK. Oh, yes.

The CHAIRMAN. Take up your next item, "Local adjustment and adaptation of varieties." I presume you have practically covered that.

Mr. COOK. Yes. This relates to methods of selection under local conditions to keep their varieties well up to a good standard of performance. Experiments have shown that locally grown and selected seed usually gives better results than seed of the same variety brought in from some other region where the conditions of growth are different. This indicates that if the factor of local adjustment were taken generally into account and selection continued there would be no need of so many varieties as are now grown in the different parts of the cotton belt. It would be much better, both agriculturally and commercially, if each community or district regularly raised only one variety.

Not so many new varieties are being sent out through the congressional distribution of seed as in former years, but the general distribution of small packages of seed is being followed up with a special distribution of half-bushel lots, with a view to establish supplies of pure seed in districts where the new varieties give the best results. We have records of over 3,600 acres planted with pure seed of our new varieties in different parts of the cotton belt in the season of 1915 as a result of these special distributions of seed in half-bushel lots. This includes only the growers who have reported that they are taking special care of the seed to avoid admixture with other varieties.

The CHAIRMAN. The next is "Breeding and preservation of varieties." This is to hold your cotton to type?

Mr. COOK. Yes. That relates to the breeding of these new varieties and also to maintaining the characteristics of these varieties by continued selection from the best strains so that we will have on hand a variety of real pure stock that we can send out gradually and keep the type normal under cultivation. The great difficulty with the varieties that have been sent out in the past was not that they were not superior varieties but that they would not remain uniform. Now we have developed a very simple and effective method of selection, based on the fact that most of the undesirable variations can be recognized in the field and pulled out, even before the flowering stage is reached. This avoids the contamination of the stock by crossing with the inferior plants.

The CHAIRMAN. You have to continue the method of selection from year to year, or else the cotton goes back to its original type, does it?

Mr. COOK. It does not go back to the original variety, but it goes back to the original condition, in the sense that its uniformity is lost by failure to maintain selection. As an example of that, I have a sheet of combed-lint samples here. The middle plants represent one of the normal individuals of the Lone Star cotton, which is one of our short-staple varieties like Triumph, but a little longer and a little better in some other respects. On either side are two individuals designated as being off-type plants. I could see from the outside of the plant, before combing the lint, that these were not representative individuals of this variety. I took the other two samples from the adjacent normal plants as a comparison, and the seeds were combed out. They show that each one of these abnormal plants appears to be of a variety different from the original—generally inferior to the original. Now and then you might get a superior selection in this way, but in our selection we must guard the varieties from these inferior and abnormal individuals. You can see at once that those two cottons are distinctly inferior, and if allowed to stay in the stock would contaminate it and cross it with the inferior plants, and our uniform variety, in a few years, would deteriorate into a mixed stock. You might still be able to find normal individuals, but a very large proportion would be inferior individuals resulting from a crossing between these and the original plants.

The CHAIRMAN. Take your next project, "Acclimatization, adaptation, and extension of corn."

Mr. COOK. The same methods are being applied to the acclimatization, adaptation, and extension of corn as in the case of cotton,

principally in the line of finding varieties of corn that will be more hardy in parts of the country where corn is not a principal crop, such as in parts of the Northern States, in the Southwestern States, and in the Pacific coast States. And the results in several cases are very striking. Then we have varieties of corn that have peculiar characteristics which enable them to live under particular conditions. A very striking example is an Indian corn that is cultivated by the Navajo and Hopi Indians in northern Arizona, who raise their corn entirely on a high plateau region, where no white man would imagine that corn would grow. They have done this for many years, for some. They have a system of planting this corn in holes several inches deep—sometimes a foot or more. They have a variety of corn in that way for the reason that they must plant deep enough to find moist soil that will allow their corn to germinate, and this gives it a position to take advantage of the summer rains.

Now, ordinary corn can not be planted in that way; that is, the commercial varieties of the types of corn cultivated in other parts of the country could not be planted that way, because it would never come up; it would be unable to penetrate so great a depth of soil above it. But with this Indian corn the first joint that is formed—it is more like a root, really, than a joint—above the seed grows several inches long and is able to bring the first leaves of the young plant out to the surface of the soil. The other corn does not have a joint of this length, and, if planted to the same depth, its leaves would unfold down in the ground and never find their way out. This specialized type of corn has been grown during the past season in other districts of the Southwest and has matured and produced a good crop under conditions where corn was not supposed to be a possible crop.

Mr. HAWLEY. You have reason to believe you can develop a type of corn that will grow anywhere in the United States?

Mr. COOK. It appears that way, especially as in the plateau regions of Mexico and South America we have found many of these very peculiar types of corn existing under special conditions.

Mr. HAWLEY. In the Imperial Valley they have trouble getting corn on the ear that matures well and would keep after it matures. It would either mold on the cob or would mold after maturing.

Mr. COOK. Yes. This year we grew for the first time near the coast of southern California a type of corn obtained from the high Andes of Peru, which is raised at an elevation of 13,000 feet in Peru and Bolivia, and this matured corn with no serious impediment.

Mr. HAWLEY. Will it grow in a low altitude also?

Mr. COOK. Yes; this was nearly at the sea level.

Mr. HAUGEN. How many days are required to mature it?

Mr. COOK. About 60 days.

Mr. HAWLEY. Have you any stock of that corn?

Mr. COOK. No; we knew of its existence only this year.

Mr. HAWLEY. Are you going to experiment with it?

Mr. COOK. The Indians only raise it for making chicha beer in that high altitude. They do not eat it. It is a small, peculiar, stunted corn, but the question is whether it can be used in developing a better variety.

HAUGEN. What is the character of the ears?
COOK. Some of them are 3 inches long, but most of them are r 2 inches; from 2 to 3 inches long.
HAUGEN. Is it similar to our popcorn?
COOK. No; the kernels are relatively large. It is not a popcorn, milar to the other varieties of large-seeded South American

HAUGEN. How large is its yield?
COOK. We do not know. The ears are small, but the stalks may ose together, as in the case of a Chinese variety, which is resistant in Texas. This Chinese corn can stand in the or 4 inches apart and then gives a respectable yield; almost , of course, if planted wide apart as a large corn would be.
HAUGEN. You spoke of the Indians growing corn. Is that by of listers?
COOK. Oh, no; they have no listers. They simply plant the pits.
HAUGEN. How are the pits made?
COOK. They dig those with a hoe.
HAUGEN. They do not use listers.
COOK. No; it is all done by hand. They do not use any farm at all. These are Indians who have always lived on this There are only a few agricultural Indians living in the st.
HELGESEN. How deep do they plant that?
COOK. They plant it a foot deep and do not fill the hole. It comes up through 8 or 10 inches.
HAUGEN. It just rests on the moist soil?
COOK. The seed rests in the moist soil; otherwise the corn ot be able to germinate.
CHAIRMAN. Are you doing any work on corn smut?
COOK. No; that comes under another item.
CHAIRMAN. Take up your next project.
COOK. "Acclimatization and adaptation of tropical plants" is lual project. We went to Guatemala in the first place to ffee culture and found this type of cotton growing there. rted on the cotton and were sent back for additional infor- nd began to raise it in Texas. And after that the work on cal plants has continued in connection with explorations for es of cotton and corn. We are continuing to pay attention, r we can, to other plants of those tropical countries that grown in the United States. Perhaps the most specific is this: In the plateau regions of Guatemala they have a avocado, or alligator pear, whichever it may be called, which product of very great importance in this part of the world. e of avocado has a hard shell and ripens in the late fall and ring instead of in midwinter. The people in California and have been interested in the development of the avocado as a ial industry like the citrus fruits. They recognize that the es of these Central American avocados are of very great ice. They have, in the first place, a hard shell, which facili- pping. In the second place, fruit comes into the market is not in competition with the regular summer fruits and es of our climate.

The CHAIRMAN. What progress have you made with that?

Mr. COOK. The actual work in the United States is being handle by other offices, but in 1914 we made a special trip to Guatemala fo this and brought back not only the seeds but budding stock of th best trees that we could find. The cuttings were brought home safely The budding was successfully done, and the young trees are no being grown, so that they will undoubtedly fruit in a year or two.

We have a very great many inquiries regarding other tropica plants—coffee, cacao, and a great many others. We feel that our us in that regard is often a negative one; that is, we advise peopl against spending their money on foolish propositions, such as th culture of rubber in Mexico and Central America, in which, becaus the wrong kind of tree was used, people have sunk millions of dollar We furnish information in reference to many such matters and hav saved millions of dollars for people who otherwise would have gon into them.

The CHAIRMAN. Just one further question: This increase of $5,00 is asked for to do what particular thing?

Mr. COOK. That is especially with reference to the extension of thi new method of cotton culture with the new varieties—that is, w need to try out this method more extensively under more local cond tions of the cotton belt so as to be able, as soon as possible, to giv definite instructions with regard to it in different parts of the cotto belt and with respect to different types of cotton which behave som what differently. For example, we may find that one variety ough to be put 6 inches in the rows, while the rows of others would l 8 to 10 inches in order to secure the highest yields in the shorte seasons.

The CHAIRMAN. What is your method of disseminating this i formation—through the county agent, or in what way?

Mr. COOK. Yes. The question is to get the information, but it wi be disseminated chiefly through the county agent and by local demo strations with the farmers where we carry on the experiments. B we do not attempt to conduct these demonstrations on any gener basis. Our effort is to put the system in such shape that the coun agents and local organizations can do the extension work.

The CHAIRMAN. Is it your purpose to employ some men to do thi

Mr. COOK. Yes. We will need one or two additional men. B one of the chief items of expense is the traveling expense of supe visors; because it is cheaper to send men around than it is to hi additional men.

Mr. HAUGEN. Did I understand you to say that rubber can not l produced in this country or in Mexico?

Mr. COOK. No; the difficulty in Mexico was that they started wi the wrong kind of tree.

Mr. HAUGEN. They can produce it?

Mr. COOK. Yes; probably if they plant the other type of trees. is the kind of tree. They have put it on a commercial basis in the Ea Indies. They not only had the proper kind of tree but they ha cheap and skillful labor, so that the plantations are now producin on a commercial scale.

Mr. HAUGEN. The proper tree can be imported?

Mr. COOK. The tree is the first thing. It is a native of Braz They are now competing with the Brazilian wild rubber, owing

the more favorable labor conditions in the East Indies. In Mexico they started out with a species of tree which would not stand frequent tappings. This tree does not restore the milk in the bark, so that when once tapped it takes a long period to recover, if it ever recovers fully.

Mr. HAUGEN. In order to grow it the right kind of tree must be grown?

Mr. COOK. Yes. If they had started in with the Brazilian type in Mexico, there is no reason why they could not have grown it; but they went ahead with native trees and disregarded the differences between the various rubber-producing species.

STATEMENT OF DR. W. W. STOCKBERGER, PHYSIOLOGIST IN CHARGE OF DRUG AND POISONOUS PLANT INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Now, Dr. Taylor, take up item 81, "For the investigation, testing, and improvement of plants yielding drugs, spices, poisons, oils," and so forth, $48,820, with no increase.

Dr. TAYLOR. Under this item, Mr. Chairman, we conduct two rather distinct types of work. The first, that which relates to the investigation of plants yielding drugs, spices, oils, and other related products, and the second certain general physiological and fermentation investigations. I will ask Dr. Stockberger, who administers the drug and poisonous-plant project, to discuss this first; then Dr. True to follow with an outline of his work.

The CHAIRMAN. All right, Dr. Stockberger.

Dr. STOCKBERGER. Mr. Chairman and gentlemen of the committee, with your permission I desire to make a few general statements before taking up the discussion of the projects or lines of work in specific detail.

It is important that the line of work represented under this general and somewhat miscellaneous title be understood in its real significance. A great deal of the work of the Bureau of Plant Industry is concerned with our staple crops, which are of vast importance, both in point of view of their money value and to the people at large.

The work which falls under drug-plant investigations consists of a congeries of crops rather than one or two large ones, so that when any one particular line is examined in specific detail by comparison it appears as but a dot upon a rather large surface. For example, the monetary value of some of our single lines of work is exceedingly small. But I desire to direct attention to the fact that the monetary value of these crops does not represent their economic or social value. To illustrate what I mean, take some of our common medicinal plants. I may cite digitalis, which is perhaps more or less familiar to you all, one of the most important and valuable heart tonics, which has unquestionably in numberless cases been an instrument in the hands of skillful physicians for saving human lives. Now, the money value of this crop is perhaps so small as to render it almost beneath the consideration of this committee, and yet who can estimate the importance and social value to the people of this country of this agent in the hands of physicians, who may at any time need it to save human lives?

And so with many of our medicinal plants. They play a part in our general and social economy which, as I have said before, is scarcely to be reckoned in the units of value customarily applied to other crops.

Mr. HELGESEN. Are those plants that have only an insignificant money value so scarce in the markets of the world that it becomes necessary for this Government to raise its own?

Dr. STOCKBERGER. Some of them are becoming very scarce. Quite a large number of the plants which are listed in the official list of medicinal plants, the United States Pharmacopœia, have been collected in the United States and are indigenous to and grow only in this country. A good many of those have now reached the point where they are approaching extinction; that is, the natural supply is rapidly being exhausted.

Mr. HELGESEN. Outside of this country?

Dr. STOCKBERGER. I am speaking of this country.

Mr. HELGESEN. What is the situation outside of this country?

Dr. STOCKBERGER. Outside of this country the situation is constantly changing. Many of those plants are still produced in the wild, and changed economic conditions are hindering the source of supply, and within the last two years specific economic conditions prevailing abroad have resulted in an enormous decrease in the available supply. In fact, a great many of our imported products, drugs and medicines, have become almost unobtainable and have enormously increased in price, the increase in price in many cases ranging up to 1,000 per cent.

Mr. HELGESEN. Of course you would not recommend to this committee to make an appropriation based upon present extraordinary war conditions?

Dr. STOCKBERGER. Not at all, sir; that is not in my mind. The conclusions which I am presenting are based entirely upon economic conditions which prevailed prior to the outbreak of the present war.

The CHAIRMAN. It seems to me, however, Doctor, that the war conditions emphasize the fact that this country in these particular things ought to be independent of the world; it ought to be self-sustaining, as it were. Is that true; is that your idea?

Dr. STOCKBERGER. Yes. I think that is a point which might receive your careful consideration. It is, it seems to me, quite within the realm of public policy for us to consider whether or not this Government should take some effective means to safeguard its people in just such an exigency as the one which has arisen at the present time. And I desire to say to you, sir, that I believe the action of this committee in granting appropriations for this work for a number of years has made possible important progress in that direction. It has enabled us to collect valuable information and to produce experimentally many of these plants, so that last year, when this crisis came upon the country and the supply of many of our important medicinal plants was for a time absolutely cut off, rendering them scarce upon the markets and advancing prices to an unheard-of level, we were prepared to show to the people who were ready and desirous to cultivate certain medicinal plants how to do it. Many plantings were made, as I shall show you later; crops have been harvested, and some of our people have reaped the benefit of some of the higher prices that have prevailed, while at the same time our

supply of these materials has been guaranteed, and, I think, general good has resulted.

Mr. CANDLER. Necessity, which is the mother of invention, has demonstrated to us possibilities of useful industries in the United States that we did not appreciate before, has it not?

Dr. STOCKBERGER. I think so, sir; and has also called attention to another fact. It is well known that for many years there has been a distinct tendency for our agriculturists to direct their energies along limited lines. Perhaps that is indicated most clearly by certain types of agriculture prevailing in the South, where the farmers have confined their efforts very largely to the cultivation of a single crop. Present economic conditions have not only emphasized the necessity for a more diversified type of agriculture than that which has existed heretofore but have called the specific attention of the people to the opportunity which exists along this line.

Mr. CANDLER. Might it not be advisable, then, that we pursue some of those matters in order that we may make ourselves independent in the future when similar conditions arise?

Dr. STOCKBERGER. I think that would be good a policy not only from that point of view but from the other one of employing some of our farmers in lines of production which divert to a certain degree the activities of capital and labor from some of the larger industries, which are already crowded, so as to supply to us from our own fields products for which we are now spending money abroad.

In that connection I may say that the declared value of the imports of the products which fall within the scope of the investigations indicated here, as shown by the latest statistics which are available, covering normal times, namely, for the fiscal year 1913, indicates that something over $25,000,000 is expended for drugs, oils, spices, and condiments, many of which, we believe, can be produced in our own country, and that much of the money now spent for them abroad may be kept in the hands of our own people.

The CHAIRMAN. Now, Doctor, will you kindly take up the items as they appear in the Program of Work, please.

Mr. HELGESEN. Have you any concrete examples of the results obtained in the way of making us independent of other countries?

Dr. STOCKBERGER. Yes, sir.

The CHAIRMAN. Will not that come in the regular discussion of the program?

Dr. STOCKBERGER. Yes, sir; that will be developed. In fact, I wish to say that the discussion of these projects will be very largely, or almost entirely, from that standpoint. And if I may add just one further word to my general statement, I wish to say that sharp distinctions should be drawn with regard to the adaptability of these crops. Unfortunately, there have been widely circulated reports to the effect that there were enormous profits to be made in the production of many of our drug plants. Perhaps that is true, but it is true only to a certain degree. The opportunity for a profit does not necessarily mean that any large number of persons can engage in this particular business. The production of cotton and corn gives opportunity for the employment of millions of dollars of capital and thousands of laborers, while the production of drug crops, though profitable to a degree, does not offer the same opportunity. And a great deal of our work consists in furnishing a type of

what was previously referred to by my colleague, Mr. Cook, as negative information. We have been trying to keep people from putting time, energy, and money into unwise investments in these lines.

Now, sir, to take up the first of the projects in the Program of Work, the establishment of the camphor industry, I wish to say very briefly that as a result of the department's work two large commercial plantations of camphor have been established in Florida. I have here [exhibiting photograph] a general view of one of those plantations, which will give you some idea as to its appearance. These apparently small rows represent rows of the camphor trees, or hedges, as they may be properly called. They are about 15 feet apart, and the plants, as you see, are perhaps 8 feet high. This plantation is the first one started in the State of Florida, as a result of our work, and has now 1,000 acres of camphor-bearing trees.

The second plantation involves a tract of land of about 18 square miles extent, and that is rapidly being cleared and planted to camphor trees. Ultimately, this will reach perhaps an area of 10,000 acres. These [exhibiting photograph] are the two large commercial plantings in the State of Florida, and there are many smaller plantings, none of which has yet reached the stage of real active commercial operations. The locations of these plantings is indicated on this map [exhibiting map], and there are some figures there as to the value of our annual imports, which I will have inserted in the record, if that is desired.

(The statement referred to follows:)

Importations of camphor into the United States.

[From the Oil, Paint, and Drug Reporter.]

	Pounds.	*Value.*
Camphor, crude, natural:		
1910	3,026,650	$921,9
1911	3,726,319	1,118,8
1912	2,155,751	682,7
1913	3,477,760	979,3
1914	3,476,908	925,7
Camphor, refined:		
1910	492,583	177,1
1911	492,111	165,2
1912	248,389	93,0
1913	463,410	153,0
1914	624,508	201,9

The CHAIRMAN. I wish, Doctor, that you would tell us how much profit may be expected from an acre of camphor.

Dr. STOCKBERGER. Mr. Chairman, that is a very difficult question.

The CHAIRMAN. If it is not too much of a guess.

Dr. STOCKBERGER. That is the type of question which makes most of us feel like getting under the table.

Mr. HAUGEN. How long ago has it been since it was ascertained by the department that it could be grown here?

Dr. STOCKBERGER. It has been known for many years that the trees would flourish in this country. The trees were first imported some 40 years ago and have since been grown all along the south-gulf coast, and some trees in sheltered situations as far north as Charleston. We have known for 25 years that the trees would flourish in the South, but we had not known that it was feasible to try to grow

them as a source of camphor supply. That was only learned, I think, 7 or 8 years ago. At that time my colleague, Dr. True, was in charge of the work, and it was under his direction that these early experiments were undertaken. It was then demonstrated that by the simple process of pruning the leaves from the camphor trees and distilling them camphor could be obtained and the life of the tree continued; in other words, that the crop, instead of being a 50-year crop, would become an annual one.

Mr. HAUGEN. It was demonstrated to your entire satisfaction that it could be grown with success eight years ago?

Dr. STOCKBERGER. That the tree could be grown. I do not mean to say that it was demonstrated to our satisfaction that camphor could be produced profitably, because that is another question; but we were assured that the tree would grow well in that section. There are, however, many details in connection with the harvesting and with the production of the camphor itself which are yet to be worked out.

Mr. HAUGEN. You are satisfied now that it can be produced on a commercial scale?

Dr. STOCKBERGER. It is being produced on a commercial scale in Florida at the present time.

Mr. HAUGEN. And you have encouraged its production?

Dr. STOCKBERGER. Yes, sir.

Mr. HAUGEN. And you say that the industry has been established?

Dr. STOCKBERGER. The industry has been established.

Mr. CANDLER. What is crude camphor worth at the present time?

Dr. STOCKBERGER. Crude camphor at the present time is worth approximately 40 cents a pound. The price varies, and that figure is only approximate.

Mr. HAUGEN. Is that the wholesale or the retail price?

Dr. STOCKBERGER. The wholesale price. To return to your point, Mr. Chairman, I do not like to mention a figure, because it is almost impossible to give costs of production. But we believe that when the necessary business details are taken care of, and with a properly organized plan of operation, perhaps the net return—I merely am hazarding a guess—will be $10 or $15 an acre. That is purely an estimate.

Mr. HELGESEN. Do you think it can be produced here in competition with the imported camphor?

Dr. STOCKBERGER. I believe so. There is the consideration to face that we have an industry in this country based upon the utilization of camphor, the control of which is practically in the hands of a foreign monopoly. And I may say, further, that the very people who are interested in these camphor plantations in this country are themselves the largest consumers of camphor in this country. They have made full investigations and have evidently satisfied themselves that there is an opportunity for its profitable production.

Mr. HAUGEN. Are we to understand that the American producer sells the product to the monopoly?

Dr. STOCKBERGER. No, sir; this monopoly is the Japanese Government. They sell in this country to the American purchaser.

Mr. HAUGEN. He puts it on the market in competition with the monopoly?

Dr. STOCKBERGER. Yes.

Mr. McLAUGHLIN. Do you think this industry could be fostered and developed by imposing protective tariff duties?

The CHAIRMAN. That is hardly an agricultural subject, Doctor.

Dr. STOCKBERGER. I was about to say that I am not an expert on tariff matters.

Mr. McLAUGHLIN. Because it is a sensitive matter here, I do not think that argues that it is out of the line of our inquiry.

The CHAIRMAN. The Doctor does not qualify as an expert on the tariff; do you, Doctor?

Dr. STOCKBERGER. No, sir.

Mr. HELGESEN. No; but he does qualify as the expert of the Government to advise people whether to go into the camphor industry or not. Now, if competition is not good and if the product is now absolutely controlled by a monopoly, why are we not to expect in case the industry is developed here that the monopoly will do like the Standard Oil and various other monopolies have done—put the price down so low as to put our growers out of business; and, having put them out of business, they will put up the price again. If you are going to advise people to go into this thing, it seems to me they ought to know whether the business is going to yield them a profit.

Mr. McLAUGHLIN. It seems to me it is a proper question, and, without being uncomplimentary to the doctor, I should like to know what his opinion really is.

Dr. STOCKBERGER. This is our information with respect to the operation of the monopoly: Several years ago, at about the time this camphor experiment began, the price of camphor was $1 a pound. Since then it has been reduced and is now about 40 cents a pound. Nevertheless, there is a point, I believe, Mr. Chairman, in connection with the production of camphor in Japan beyond which the Japanese Government, perhaps, would not care to go in reducing the price that would still leave a margin of profit for our American product.

Mr. McLAUGHLIN. Is there any reason to believe that the Japanese Government will reduce the price of camphor for the purpose of embarrassing those who would engage in the industry in this country?

Dr. STOCKBERGER. There is no reason that I know of for the assumption that such might be the case. I have no information concerning the internal reasons which induced the Japanese Government to reduce the price of camphor.

The CHAIRMAN. Now, Doctor, take up your next line of work, please.

Dr. STOCKBERGER. The next line of investigation is that which deals with red pepper and tea cultivation.

Mr. HAUGEN. Before you leave the camphor matter, can you give the number of pounds of camphor produced in this country?

Dr. STOCKBERGER. No, sir; I do not know; because that is information which the companies producing camphor do not give out.

Mr. HAUGEN. Can you give an estimate?

Dr. STOCKBERGER. No; I could not even do that; because these companies simply decline to give out any information.

Mr. HAUGEN. You referred to a 1,000-acre plantation. How many pounds per acre were produced?

Dr. STOCKBERGER. We estimate that under maximum conditions—that is, when a plantation reaches full bearing capacity—an acre

ought to produce about 150 pounds. But not all of these trees are in perfect bearing; they are simply beginning, that is all.

Mr. CANDLER. This statement here says 1,000 acres produced 10,000 pounds of crude camphor last year.

Dr. STOCKBERGER. That statement should be qualified by saying that the plantation was laid out by putting in a few hundred acres each year, and that while that number of pounds was produced on this plantation of 1,000 acres, it does not mean that you are to divide the production by the acreage, because the crop is not a full one. The trees have not yet reached full bearing; it takes perhaps seven or eight years for them to reach full bearing.

Mr. CANDLER. That is what I was asking about, because, if 1,000 acres produced only 10,000 pounds and the camphor was worth 40 cents a pound, the yield would be only $4 an acre.

Mr. MCLAUGHLIN. Did you give the figures showing the full consumption of camphor in this country?

The CHAIRMAN. You have the figures there—3,000,000 pounds of the value of $1,000,000.

Dr. STOCKBERGER. Three million pounds is the annual importation, valued at about $1,000,000.

Mr. MCLAUGHLIN. And what is the consumption in this country?

The CHAIRMAN. That is practically the consumption; presumably that is the consumption. You see, we produce only a very limited amount now.

Mr. MCLAUGHLIN. Did not the doctor say that the appraised value of the imports was $25,000,000?

The CHAIRMAN. That referred to all these drug plants.

Dr. STOCKBERGER. Yes; not of the camphor alone. That was only about $1,000,000.

The CHAIRMAN. $1,831,000. Now, take up your next project, pepper and tea investigations.

Dr. STOCKBERGER. Little need be said about the tea investigation. That is practically closed so far as the department is concerned; we have now practically withdrawn from that, except in an advisory capacity.

The CHAIRMAN. Are you spending any money on that at all, except possibly a little for traveling expense?

Dr. STOCKBERGER. No; not at the present time.

The CHAIRMAN. Dr. Shepard is dead?

Dr. STOCKBERGER. Dr. Shepard is dead, and with his death the contract relations with the department ceased. There is a possibility that the work may be continued, but the department at the present time is spending only a small sum for general traveling expenses in connection with the closing up of the tea work.

The CHAIRMAN. You have proved beyond any doubt that tea can be raised in this country, if labor conditions are good?

Dr. STOCKBERGER. Oh, yes; I think so.

Mr. HAUGEN. Can you compete with the quality of the tea that is imported?

Dr. STOCKBERGER. That is purely a question of taste. A great many people who have tried the American tea prefer it to the exclusion of the imported tea.

Mr. HAUGEN. I believe it was contended some years ago that th was some secret process about it of which this country had knowledge.

Dr. STOCKBERGER. That might be said of a great many crops; t these secrets usually are found, upon investigation, to be of l importance than people have been led to believe.

Mr. HAUGEN. You are not now growing any tea down wh demonstrations were made.

Dr. STOCKBERGER. None at all. The red-pepper industry I w dismiss with a very few remarks, because I have condensed on t sheet a statement of the work which is being done with respect this particular crop.

Red-pepper imports.

[Unofficial estimates.]

	Pounds.	Valu
1910	4,319,764	$388
1911	5,242,284	557
1912	6,422,773	597
1913	4,022,755	412
1914	8,829,487	1,007

The pepper crop in South Carolina.

Acres harvested in 1915	
Pounds harvested in 1915	152,
Average yield per acre (pounds)	1,
Average gross return per acre	$128
Total value of pepper crop in 1915	$15,

It must be clearly understood that these figures for peppers, a all other drug crops, are largely derived from experiments carr on under favorable soil and climatic conditions and under exp supervision.

As the statement shows, the imports of this material in the y 1914 ran 8,800,000 pounds, and the declared value of our imports v over $1,000,000.

The experiments with red pepper have led to the introduct and extension of its culture in the United States. This crop has b introduced into South Carolina, and may now be regarded as established industry. The work of the department consisted fi in determining the conditions under which pepper could be p duced and then in acquainting the trade with the pepper and ov coming their prejudice until they were willing to accept it. Th the crop was introduced to the hands of the farmers, and little little the cultivation of the pepper has been turned over to th until now there is an established industry, which, as will be s from this map [indicating], covers a considerable area. Next y if present plans are carried out, we will have 550 acres devoted this new crop in South Carolina.

Mr. HEFLIN. Do we grow paprika?

Dr. STOCKBERGER. It has been produced in connection with experiments. It is a milder type of pepper.

The CHAIRMAN. This is not the old-fashioned red pepper?

Dr. STOCKBERGER. No; it would scarcely come in that category. I have used the term "red pepper" because this includes not only the milder types, of which paprika may be mentioned as an example, but also the cayenne and other hot varieties, the opportunity for the growing of which, as well as for the milder types, exists in the South.

The CHAIRMAN. Is this likely to be a rather profitable crop, so far as you have been able to ascertain?

Dr. STOCKBERGER. It has proved to be so far. The figures of production are given on the sheet. The returns show that the crop is, on the whole, we believe, taking one year with another, considerably more profitable than cotton.

The CHAIRMAN. Your average yield per acre is 1,288 pounds, and the average gross returns per acre $128.80. You do not give the average net return. Is it a very expensive crop to cultivate?

Dr. STOCKBERGER. It is perhaps a little more expensive than cotton.

The CHAIRMAN. This says from $20 to $30 an acre.

Dr. STOCKBERGER. Let us say $40 an acre. This shows that the yield was 1,288 pounds for this year, so that this year it has been a very profitable crop; and, judging from the market demands, there is an appreciation of the product on the market, and our experiments seem to justify the extension of its culture within reasonable limits.

The CHAIRMAN. How far north can this pepper be grown?

Dr. STOCKBERGER. It can be produced commercially at a profit, I should say, scarcely outside of the cotton belt. We can grow the pepper farther north, but there are certain climatic and other difficulties, so that it becomes a crop which is best adapted to the South and Southwest.

The CHAIRMAN. I see.

Dr. STOCKBERGER. Associated with this project and illustrated on the sheet which is being passed around, there are some supplemental crops which are being brought along as the pepper has been introduced. There has been formed among pepper growers a little farmers' organization which is looking after their interests and keeping their stock of seed pure, and we hope that it will continue the development of the project and that these other crops will follow along in the same fashion.

Mr. HELGESEN. All of these drug plants are southern plants, are they not?

Dr. STOCKBERGER. No, sir; not all. A great many of them can be and are being grown in the North, in Wisconsin, some can be grown in the New England States, and some are being produced in the West. In fact, some of the difficulties associated with this work arise from the fact that there is such a large number of medicinal plants and such a variety of climatic conditions under which they can be produced, including the subtropical and the extreme northern conditions of this country.

Mr. HELGESEN. I tried to get in when you were on the tea proposition, but did not. I just want to ask a question. The tea proposition is one of the things where we meet with ridicule from the country. It may be because they do not understand it, but they have an idea that it never can be made a commercial proposition. Now, what do you say to that?

Dr. STOCKBERGER. I should say the results of the experiments conducted by this department in cooperation with Dr. Shepard, at Summerville, S. C., and the statistics of production and sales over a period of a number of years, as published in one of our Bureau of Plant Industry bulletins, seem to indicate that, given proper labor conditions, to be sure, the tea could be made to yield a reasonable profit. There seems to be an opportunity. There are perhaps many reasons why that project has not been taken up and why capital has not been invested in it. We have to deal with the fact that there is a tremendously large and old-established import trade, and the trade is slow to move out of the old-established channels into new lines. That perhaps has been the largest retarding factor. I may say, sir, that information has come to me that a proposition is now being considered to continue the cultivation of tea in South Carolina on a commercial basis; that is, I have been informed that a commercial organization is considering the continuation of that enterprise.

Mr. HELGESEN. How large an industry is it now?

Dr. STOCKBERGER. In the South?

Mr. HELGESEN. Anywhere.

Dr. STOCKBERGER. In this country?

Mr. HELGESEN. In this country; yes.

Dr. STOCKBERGER. It can not be called an industry at the present time. The total amount which Dr. Shepard was able to produce, because of his very small gardens, was never more than a few thousand pounds; I think, perhaps, from 10,000 to 15,000 pounds.

Mr. HELGESEN. Per year?

Dr. STOCKBERGER. Per year. So that it is really very small. It was largely in the way of an experiment.

Mr. HELGESEN. How many years have you been experimenting?

Dr. STOCKBERGER. The experiment has been running perhaps a matter of 15 years, I think.

Mr. ANDERSON. It was started in 1902.

Dr. STOCKBERGER. That was the date of the establishment of the project. I think there were some experiments with tea that antedated 1902. But that is about the length of time.

Mr. HELGESEN. About how much money has been spent on the proposition?

Dr. STOCKBERGER. The original appropriation was $10,000 a year; that continued for some years and has been gradually diminished.

Dr. TAYLOR. It has been about $2,000 a year for the last several years.

Dr. STOCKBERGER. For the last four or five years.

Mr. HAUGEN. The project was practically abandoned for a number of years by Congress.

Dr. TAYLOR. It was continued merely as a cooperative project with Dr. Shepard, with a view to insuring to the public the information that should result from the continuance of his work, so long as that continued.

Mr. HELGESEN. Do you claim for this tea that it is a superior article to that which is imported? You say it is a superior tea and the equal in value of the article in the market.

Dr. TAYLOR. This tea would rate, roughly, I should say, with dollar tea, imported.

Mr. HELGESEN. That is a very high class of tea.

STOCKBERGER. This is a high type. This is recognized as a ade, high-type tea. It is not in the mind of anyone, I think, e competition of the low-priced teas of the Orient could be fully met by production in this country under conditions as a.

HELGESEN. That is the reason I asked the question, because, t was of a superior quality, they never could meet the labor ns of the Orient.

HAUGEN. You said it could be done with proper labor condi- Have we the proper labor conditions anywhere in this ?

HELGESEN. For a high-class article they might have.

HAUGEN. I mean had Dr. Shepard on his estate?

STOCKBERGER. Dr. Shepard, on his estate in South Carolina, le to produce his tea at a profit, and so the necessary labor ns existed there at the time of his experiments. That state- ir, is just a qualification that I always feel like making in ring a point of that kind, because perchance the difference be- uccess and failure of any business enterprise depends upon ilability and the price of labor. That, of course, governs, and a factor which changes from time to time with economic con- or with localities.

CHAIRMAN. Take up your next item.

STOCKBERGER. The next is hop improvement. This is an in- the value of which was not included in the statement which regarding the drug plants—that is, the $25,000,000. The in- ranks usually about the fourteenth among our agricultural ises in this country. Its annual value ranges from nine to n or fifteen million dollars.

experiments conducted have been very largely in the direc- improving cultural conditions and also to settle some of the al questions concerning market conditions. There were some ies with the American hops, some peculiar phases of competi- the markets, which it has been desirable to investigate in o determine, if possible, what those differences are and upon ney rest. Our results have been very satisfactory, particu- long the lines of improving cultural conditions. We have ble, very positively, to show the farmers, especially of the coast, where by modifying their practice they could reason- pect to increase their production by at least as much as 10 t and, under some conditions, more. So that, where the prac- ommended by our bureau has been adopted, it has met with satisfactory reception and is said to have resulted in a very increase in the production of their fields.

CHAIRMAN. Take up your next, vegetable-oil crops and their s.

STOCKBERGER. The study of vegetable-oil crops and their s includes quite a series of investigations. The oils con- are of two classes, volatile oils and fixed or fatty oils. There secondary questions, of which I may speak, with regard to duction of these oils and by-products. I have tabulated the results of an investigation which has just been finished ne utilization of cherry by-products or waste cherry pits and sulting from the commercial canning of cherries. There

are wasted annually relatively large quantities of these prod This is true also of the wastes derived from peaches, prunes, a cots, raisins, and a number of other fruits. This tabulation me illustrates the type of general investigations which we are cond ing along these lines.

The investigations have been conducted to determine the qua of these materials, the nature of the waste, and its possibilit utilization. The figures in the table, which I will put into the ord, show that waste cherry pits and juice yield several pro which are of considerable prospective value. One is a fixed somewhat of the type of salad oils; another, a volatile oil; a third product, of less importance than the others, a meal w could be used successfully, according to its chemical analysis stock feeds. The total value of the products which might b tained from these waste cherry pits we estimate at about $12

(The tabulated statement in detail follows:)

Waste cherry pits.

Approximate annual quantity and estimated value of commercial products which may be obtain pits.]

Cherry pits.	Annual quantity of pits.	Annual quantity of kernels.	Fixed oil.		Volatile oil.		Meal.		
			Quantity.	Value.[1]	Quantity.	Value.[2]	Quantity.	Value.[3]	
	Tons.	*Tons.*	*Tons.*		*Pounds.*		*Tons.*		
Domestic cherries	1,000	448	134	$67,000	6,000	$36,000	300	$6,000	}
Imported cherries	650	58.5	26	13,000	.....	.....	30	600	}

[1] Estimated at 25 cents per pound. Price of peach kernel oil in 1915, 45 cents.
[2] Estimated at minimum price quoted for bitter almond oil at present time.
[3] Estimated at $20 per ton, the average price of standard press cakes.

Waste cherry juice.

[Approximate annual quantity and estimated value of commercial products which may be o from juice.]

Cherry juice	Annual quantity of juice.	Alcohol from total juice.		Sirup from total juice.		Jelly from juice.	
		Quantity.	Value.[1]	Quantity.	Value.[2]	Quantity.	
	Gallons.	*Gallons.*		*Gallons.*		*Gallons.*	
Domestic cherries	105,000	5,000	$1,500	21,000	$6,930	55,650	

[1] Estimated at 30 cents per gallon.
[2] Estimated at 3 cents per pound or 33 cents per gallon.
[3] Estimated at 5 cents per pint.

Another of these vegetable oils, which may well be mention this time, furnishes the product to which I now direct your a tion. These two crystals are a chemical which is doubtless fan to you all: thymol. Thymol is one of our recognized drugs, w used for antiseptic purposes. The normal price of thymol f number of years has been about $2 a pound. We have been ducting exper m in the production of this material from n sour a of commerce is very largely obtained fr used In India and sent from India to Germany

[illegible] manufac[illegible] in thymol, and from Germany it is distributed [illegible] the market of [illegible] world. Immediately upon the outbreak of [illegible]stilities in Eur[illegible] the consequent interruption of commerce, [illegible] supply of thymol [illegible] cut off, and within a few days the price [illegible]ped from $2 a pound to $17 a pound. And it has stayed up at [illegible]t figure until recently, when it has receded, and I believe the last [illegible]gular quotation I have seen is $12 a pound. Each one of those [illegible]stals is worth about 40 cents at that prevailing market price.

Now, our experiment was begun some years ago with a common weed which grows in the South and which yields this substance. We have brought it under cultivation, improved its bearing quality, and have developed a simple process of manufacture, so that this last year our cooperators were able to produce commercially and sell in the markets of New York City a very considerable quantity of thymol, for which they received a very good price, although somewhat under the figure I have just quoted.

The CHAIRMAN. You do not care to put the figures in the record there, do you, Doctor?

Dr. STOCKBERGER. I would really prefer that the figure be not mentioned, if possible.

The CHAIRMAN. What is the ordinary name of the plant from which you get this?

Dr. STOCKBERGER. It is known to botanists as *Monarda punctata*, commonly called horsemint.

The CHAIRMAN. Horsemint?

Dr. STOCKBERGER. It is just a common weed in many parts of the country, and we have improved the strain. The figure which I wish to give is the normal figure based on present fluctuations of the market.

The CHAIRMAN. Suppose you put that in.

Dr. STOCKBERGER. That is about $2. It is upon that figure that we base our idea as to whether the crop can be produced profitably or not. We have determined some figures on that point, which I can put in the record.

(The statement referred to follows:)

THYMOL PRODUCTION IN THE UNITED STATES.

Thymol is now being produced experimentally in Florida from cultivated plants of *Monarda punctata*, commonly called horsemint. The estimated imports for the past three years are as follows: 1913, 6,500 pounds; 1914, 17,811 pounds; 1915, 1,531 pounds. During these three years market quotations for thymol have ranged from $1.65 to $15 per pound.

Estimated costs and returns per acre based on experiments.

	First year.	Succeeding years.
Cost of production	$23	$19
Pounds of thymol per acre	12	19
Gross returns, thymol at $2 per pound	$24	$38
Net returns per acre	$1	$19

After this plant is once established (it is a perennial and lives year after year), we think we ought to expect an annual net return of approximately $18 to $20 an acre. But I wish to say here of this enterprise that it is to supply a market which is not large, although in 1914 our imports were about 17,000 pounds.

A further point regarding this type of enterprise, Mr. Chairman, is this: This crop is being produced in Florida. In Florida, as you all know, and in other States, there is a large area of land poorly adapted for the general purposes of agriculture and regarded as unavailable for the production of citrus fruits, vegetables, and the ordinary crops, but which our experiments have shown will yield a moderate return from some of our oil crops. In other words, we are seeking to put into the country, or into the hands of the farmers, a means of deriving profit from lands which are now lying idle and which are, perhaps, not worth being devoted to other crops.

The CHAIRMAN. Is this a wild plant?

Dr. STOCKBERGER. It is a wild plant; but under proper conditions of cultivation we improve it so that it yields a more desirable crop.

The CHAIRMAN. Does it require much cultivation?

Dr. STOCKBERGER. Almost none at all.

The CHAIRMAN. Almost none at all; that is what I was getting at.

Dr. STOCKBERGER. It does not require much cultivation; it is relatively easily handled and produced at a relatively low figure.

The CHAIRMAN. It might be made a valuable by-product of the farm?

Dr. TAYLOR. A supplemental crop.

The CHAIRMAN. Just made to fit in on the farm as a supplemental crop?

Dr. STOCKBERGER. What I said about this and the other one, which is likewise figured on the sheet, is that it would be a sort of supplemental crop for such an industry as the camphor industry, where they have a large sum of money invested in the equipment—plant and labor. During the harvesting and distilling season of camphor the full resources of the plant are utilized, but during the slack seasons there will perhaps be idle machinery and perhaps idle hands. Now, some of these other plants could be grown on the land perhaps not suitable for other purposes and could probably be utilized during these slack seasons.

On another sheet there is a statement regarding one of these projects I mentioned, and here is a small sample of lemon grass. The oil of lemon grass has an odor which I think you will all recognize. We import annually about 100,000 pounds of this oil at the estimated value of $100,000. None is produced in this country, except what we have produced and sold, and I will invite your attention to the figures given here, which are based on the actual returns of our work.

The CHAIRMAN. Suppose you read them into the record.

(The following statement was read into the record:)

Lemon-grass oil.

Annual imports (estimated)	pounds..	100,000
Value (estimated)		$100,000

ESTIMATED COST AND RETURNS PER ACRE IN FLORIDA BASED ON EXPERIMENTS.

	First year.	Following year.
Cost of production	$20	$17
Pounds of oil	25	25
Gross return, oil at 85 cents per pound	$20	$28
Net return per acre		$11

Dr. STOCKBERGER. For this oil of lemon grass we found that our gross return, at the price of 85 cents—that is what it was sold for—is $28.

Mr. MCLAUGHLIN. Per acre?

Dr. STOCKBERGER. $28 per acre; yielding, under our conditions of operating, a net return of approximately $11. And that is on land that is not suitable for citrus fruits.

Mr. HEFLIN. For what purpose is this used?

Dr. STOCKBERGER. The oil of lemon grass is used by soap manufacturers, and also by perfume makers; it is an oil very much in demand.

The CHAIRMAN. Is this a wild grass, also?

Dr. STOCKBERGER. No, sir; it is not. It is one that has been introduced. It is a semitropical grass, some of our specimens coming from the West Indies and some coming from India. It is an introduced crop, and it thrives in Florida and would grow in other of the Gulf coast regions.

The CHAIRMAN. And requires no cultivation?

Dr. STOCKBERGER. Almost none.

Mr. MCLAUGHLIN. Has much of this oil been imported?

Dr. STOCKBERGER. We import about $100,000 worth a year.

Mr. MCLAUGHLIN. From where?

Dr. STOCKBERGER. From several points; chiefly from India.

Mr. HELGESEN. In speaking of the high prices now prevailing, do you think that the exorbitant prices have brought about any greater importations of our drugs?

Dr. STOCKBERGER. No, sir; I think it is the other way around. I think it has been the cessation of imports which has brought about the prices.

Mr. HELGESEN. I understand that; but do you think an increase of prices stimulates importation?

Dr. STOCKBERGER. I have no basis for judging on that point.

Mr. HELGESEN. Is it not a fact that the people who had this drug on hand before this condition came about simply charge what they see fit for it?

Dr. STOCKBERGER. It amounts to that practically; yes. That has accounted for some of the ranges in prices. There is a very strange fact to be observed in the course of the market for the past two years. There was a decided flurry following the outbreak of hostilities in the prices of practically all drugs, without respect to whether they were produced in this country or abroad. That was simply a temporary market excitement. But unquestionably the materials which are on hand now are being held at advanced prices.

Now, Mr. Chairman, there are many other things which might be mentioned. I have tried to speak of only a few of a large number of other enterprises of which those mentioned are mere examples. However, I might speak of another little enterprise which is illustrated on one of those sheets, that of growing cannabis, another drug plant. Those figures, also, might go into the record, if so desired.

(The statement referred to follows:)

American cannabis.

Acres harvested in South Carolina in 1915	16
Pounds harvested in South Carolina in 1915	10,400
Average yield per acre (pounds)	650
(The net returns per acre from this crop materially exceed those from pepper or cotton.)	
Estimated annual imports (pounds)	100,000
Estimated value	$100,000

The returns from this crop have been found to exceed materially those from peppers, but this crop requires more expert knowledge in its production, and the annual market requirement is very much smaller.

Mr. HELGESEN. Where is that grown?

Dr. STOCKBERGER. That is grown in South Carolina.

Mr. HELGESEN. You say a good many of these are grown in the North. I do not care for you to go into the details, but what territories in the North?

Dr. STOCKBERGER. There have been several crops with which we have been working in the North. At our station in Wisconsin we have been experimenting with several such crops as sage, wormwood, belladonna, and spearmint, and other allied plants of that type.

Mr. HELGESEN. And ginseng?

Dr. STOCKBERGER. No; that is a pretty well-established industry now. We are not carrying on any commercial experiments with that particular crop.

The CHAIRMAN. Is there anything further you wish to say in connection with your work?

Dr. STOCKBERGER. I would like to say one thing further, Mr. Chairman, about another branch of the work which has not yet been mentioned, and that is included under this last caption of miscellaneous field and laboratory work on drug and related plants. Some of this work of which I have been speaking comes within that miscellaneous project. Under this item we include a lot of things; we have several hundred things going on all at one time. But as soon as a project reaches a point where it appears to offer commercial returns, we push it. One sheet which I have with me is for the crop known as sesame or benne. Some figures are given on this sheet. This is a crop which can be readily grown in the South.

(The figures referred to follow:)

SESAME.

[Oil imports (unofficial).]

	Pounds.	Value.
1910	1,310,186	$94,933
1911	1,478,897	119,443
1912	1,380,637	109,178
1913	1,936,647	155,442
1914	1,389,649	118,675

Seed imports (unofficial): 115,000 to 125,000 pounds annually.

Estimates of the acre yield and value of sesame, based on experiments.

Yield (pounds)	500–1,000
Gr[illegible] per acre	$40–80
[illegible]	$15–55

Mr. HELGESEN. For what is it used?

Dr. STOCKBERGER. It comes in in the largest quantity as an oil and is sold and used as a salad oil. It is also used in making soap; and then the seed itself is used for the manufacture of various types of confectionery. It is also used for making taheen used in Turkish candy. About $12,000 worth of taheen was imported in 1912 for consumption in this country. This is only a small oil crop.

The CHAIRMAN. It is not poisonous, is it?

Dr. STOCKBERGER. No, sir; at least, it has been eaten for many years in South Carolina. and we have not had any reports of its poisonous action.

The CHAIRMAN. If they eat it in South Carolina, it is all right. [Laughter.]

Dr. STOCKBERGER. The final statement I wish to make, with your permission, is in regard to the laboratory phase of our work. Another drug plant which is of considerable importance is belladonna, from which we derive atropine and some other alkaloids. The type of experiment to which I wish to direct your attention here is not with reference to the commercial returns from this crop—although these are very satisfactory—but to the efforts which we are making not only to grow these crops but to improve their quality. Here is a little tabulation showing the results of such improvement of belladonna. We find in our first year that plants of the ordinary type yield 0.45 per cent of alkaloid, whereas our improved type yields 0.65 per cent. Or, to put it in a different form of statement, where the ordinary type of plant would give 1.8 pounds of these valuable alkaloids per acre, our improved type of plant would give 2.6 pounds per acre. There are some other features which I have developed, by further comparison between the first and the second years, a statement of which will be put in the record.

(The statement referred to follows:)

Belladonna.

[Effect of improvement by selection on quality of crop.]

	First year.		Second year.	
	Ordinary type.	Improved type.	Ordinary type.	Improved type.
Average weight dry herb per acre (pounds)	400	400	1,000	1,000
Total alkaloids obtainable from 1 acre (pounds)	1.8	2.6	4.5	6.5
Tincture of standard strength from crop on 1 acre (pounds)	51.2	73.9	128	185.6

The object we are working toward here is not only to find a crop which will yield something by way of financial return but likewise to elevate and improve the standard of the drugs which are used so widely by the people of this country.

The CHAIRMAN. We are very much obliged to you. Now, Dr. True, I believe, takes up next the work of his office.

Mr. MCLAUGHLIN. Mr. Chairman, if we can spare the time I would like to ask the doctor a question or two in regard to the use

of these cherry pits and cherry juices. There are a lot of canning factories in my district, and we produce great quantities of cherries. Can the ordinary canning factory afford to install the machinery to carry on the process of using these cherry pits and extracting the good there is in them, and so on?

Dr. STOCKBERGER. That is a point upon which we are still collecting data in the hope of being able to give specific information. We are at present of the opinion that where the enterprise or where the individual cannery is operating on a small scale perhaps that could not be done.

Mr. MCLAUGHLIN. What do you call a small scale?

Dr. STOCKBERGER. But in case a number of canneries were operating in a community, all within a reasonable radius, and the materials could be shipped to a central plant at small cost, then perhaps the material could be utilized to advantage.

Mr. MCLAUGHLIN. That means, then, that this work must be done by a factory practically doing that work exclusively? It would not be part of the ordinary canning factory?

Dr. STOCKBERGER. I would not be willing to accept that view yet, because it is possible that we will find when our investigations are carried further that it will be possible to develop the utilization of waste as a secondary process, which may be carried on with little extra outlay for plant, equipment, and labor as a sort of a supplementary project.

Mr. MCLAUGHLIN. Have you the figures showing the cost of installing a plant to do this kind of work?

Dr. STOCKBERGER. That we have not yet. These investigations are in the stage of first discovering that valuable materials do exist in these wastes. In a way we have been looking into the dump heaps to see if there was anything in them or not. We find there are valuable materials that are being wasted. Now comes the question as to how these materials can be utilized so that they may become a source of profit instead of a source of expense to haul them away; and that is the line along which the investigations will be prosecuted in the future.

Mr. MCLAUGHLIN. I would suggest, if the doctor has anything he can add there showing the work that has been done in a practical way, that I would like to have him put it into the record.

The CHAIRMAN. Doctor, if you will do that we will be very much obliged to you.

(The statement referred to follows:)

STATEMENT RELATIVE TO THE UTILIZATION OF WASTE PEACH AND APRICOT PITS AS OIL AND MEAL.

Following the publication of a bulletin dealing with the utilization of waste peach and apricot pits, the California Specialty Oil Co., San Jose, Cal., was established and the waste pits manufctured into the oils and meal which were placed on the market. The California Products Co., New York City, became much interested in the utilization of waste raisin seeds, after the publication of the bulletin covering this waste product, but it is not known definitely whether utilization of this waste has been placed on a commercial basis at the present time.

STATEMENT OF DR. RODNEY H. TRUE, PHYSIOLOGIST IN CHARGE OF PHYSIOLOGICAL AND FERMENTATION INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. All right; Dr. True is next. This relates to the poisonous-plant investigations; is that right, doctor?

Dr. TAYLOR. The poisonous-plant investigation is a project associated with Dr. Stockberger's work, which he did not mention. It is the residuum of the project in the Bureau of Plant Industry, covering the poisonous-plant work, which in so far as it relates to live stock was transferred to the Bureau of Animal Industry last year. The Bureau of Plant Industry is still responsible for the botanical studies of these plants, and that work is covered by the project on page 129 of the Program of Work. Its continuance during the next year substantially as outlined here is contemplated.

The CHAIRMAN. Just give us what you are doing in its logical order as it appears in this program book, so we can follow it on the floor of the House.

Dr. TRUE. Yes, sir. By way of introduction, I might say the projects included in plant physiological and fermentation investigations have arisen from situations which have developed from time to time in connection with other investigations of the bureau. Certain important problems along a number of lines have remained apparently insoluble with the means at hand. Now, we have been going deeper along these lines, in the hope that perhaps we might get nearer to the roots of things. Hence, certain projects corresponding to these problems have been developed and of necessity are of an extra technical nature. These problems of which I shall speak illustrate the work. They relate to the investigations of plant physiology, working chiefly with the methods of chemistry, aimed at fundamental conditions, out of which we hope to develop facts which will enable us to explain many obscure but important things in connection with the laws governing the growth of plants and connected with their susceptibility to diseases.

The first project deals with the question of the chemical requirements of plants—that is, with materials which plants require from the soil. That is not a study of the soil or a study of fertilizers, as such. It is an attempt to find out just what part these necessary chemical materials play in the life processes of the plant. It concerns itself, therefore, with the study of calcium, of potash, of phosphate, and other substances in the living plant, as well as with the conditions under which plants absorb them.

Now, I think it was sufficiently developed in the hearings here before the committee that the fertilizer question is a live one, and it is a question on which opinions differ. That is probably due to the fact that the requirements of the plants themselves are not thoroughly understood. What does a plant do with potash? What function does lime serve? This first project is an attempt to answer those questions—to get something as a basis for an answer to those questions. For example, no fertilizer formula recognizes magnesium, but we know perfectly well that magnesium is an absolutely necessary thing to the life of every green plant. It is impossible to make the chlorophyll, the green material of the plant, without magnesium. It has been shown also that manganese, which is left out of every ferti-

lizer material, is required by some plants. This project looks toward the testing of these things and many others to see whether they are necessary, and to find out the part they play in the functions of the plant.

I may illustrate further with the case of calcium, an important and necessary constituent. We know that lime is required for the soil for various reasons. One action is to neutralize surplus acid. This has been generally recognized as the chief function of lime. It also helps the mechanical properties of soil, its tilth, and so forth. But it has a further value. It appears from this technical study, which has been carried on for the last year, that, unless the soil solution in which the plant lives has lime—accurately speaking, calcium—the plant is unable to absorb from the soil enough material to keep it alive. When the soil solution lacks a certain limited quantity of calcium the plant loses a portion of its reserve material, which it gives off into the soil. Under these conditions the soil solution becomes predatory; and only when the solution containing calcium from the lime is present is the plant able to take the necessary food material from the soil. In other words, unless calcium is present, all the other fertilizers otherwise present remain unavailable to the plant.

The second project, dealing with the physiological study of the behavior of fruits and vegetables in storage, arises out of the fact that obscure difficulties are continually coming out of the storage conditions. For example, the sweet potato, onion, and vegetables which contain much sugar are found generally to be bad storers. It has been found in the investigation which we have been carrying on with the sweet potato that the behavior of this product in storage depends largely on the temperature at which it is stored. The natural course of the sweet potato in storage is to keep the starch present in its natural form until a certain season. When this starch begins to change to sugar the amount of water present increases. Coincident with these changes the product becomes susceptible to fungus attack, to which it was not susceptible before. Now, the critical period in the storage life of the sweet potato can be postponed by the maintenance of the proper temperature at which it should be stored. At the high temperature of 70° F.—the room temperature for ordinary living purposes—the breakdown of the potato can be postponed for a much longer period than when stored at ordinary low storage temperature. The practical result which we hope to see come out of this is that, by taking into account this susceptibility of the sweet potato to break down at low temperatures, it may be possible, perhaps by shipping them in warm cars, perhaps by storing them in warm warehouses at points of consumption, to extend the use of this product over an area in time and in territory in which it is at present unavailable through its inability to stand up under usual conditions of storage.

Mr. CANDLER. What temperature should be maintained in storing these sweet potatoes?

Dr. TRUE. About 70° is a good temperature to maintain. A lower temperature will keep them for a shorter time.

Mr. CANDLER. What would be the principal time for storing the potato to put on the market?

Dr. TRUE. At present, in this latitude, sweet potatoes are consumed for the most part soon after digging. By storing for 10 days

at 90°, and then graduating down to about 70°, they can be held in this region until March. If stored cold, the sweet potatoes will all rot before Christmas.

Passing on now to the study of the relation of oxidizing enzyms to plant diseases, I may say that there has developed in connection with the work of the pathologists certain classes of diseases which can not be handled readily by the ordinary pathological methods. These difficulties are classed as physiological diseases, because not due to specific organisms. Now, in seeking the causes of these destructive types of behavior it has been necessary to look into the question of some of the various functions which are carried out in these plants. The work on oxidizing enzyms has been carried out on certain types of the Irish potato diseases; also on certain types of sugar-beet diseases. In an attempt to study the relations of oxygen to these disturbances, we have found that certain types of disease in plants, as in animals, are accompanied by an increased oxidation, suggesting a condition recognized in animal physiology as a fever condition; and then in other types of disease the oxidation relations correspond to those in nonfebrile disease.

The practical use of this information is not yet indicated. We are trying to get further information, so that we may perhaps be able later to assist the pathologists.

The spirit of these projects is to go deeper, getting something which will increase the knowledge available to the pathologist in connection with attacks on diseases and to crop men in their efforts to handle their special crops.

The next is the physiological study of molds and parasitic fungi and their relation to the deterioration of plant products. This project has come out of the fact that certain types of molds attack oats, corn, and other food products, and sometimes have been found to develop toxic materials in them. Some types of corn mold are very fatal indeed to all ordinary animals. We thought in earlier days that some of these might be responsible for some of the human diseases, for instance, pellagra, which has come to be so tremendously important in this country, and this work was begun under those circumstances.

We have extended this course of investigation to fruits and other products, seeking information not only concerning the effect of the presence of fungi on the product from the standpoint of human consumption, but we also have sought facts concerning the behavior of the fruit or material attacked by parasitic fungi.

For example, we find that at certain stages fruits are not attacked by certain fungi, and we find after a certain time when the inhibiting material or conditions protecting the fruit are modified in the natural course of the development of the fruits, that they become subject to successful attack by parasites. We are seeking light on the causes securing the partial immunity.

The CHAIRMAN. You have now concluded that moldy corn has nothing to do with pellagra, have you?

Dr. TRUE. That feature of the investigation is now closed in this office. I think, however, Mr. Chairman, that corn is still more or less under suspicion; but it has not been convicted, perhaps, in the full court.

The next project we are dealing with is the physiological study of germination. This line of study arises from the fact that there occurs at times in connection with seedings of farm crops a failure to develop a stand. There are various reasons for this. Sometimes the seed may require special conditions of temperature, moisture, or aeration to develop a stand. In connection with the seed laboratory we have undertaken certain technical investigations into the conditions which determine germination of agricultural seeds. We have been working on Johnson grass this last season, not because it is an important crop but because it is typical of the development of certain types of seed coat seen in legumes and other important crop plants and is more convenient to work with.

Dr. Brown has been carrying on this work in cooperation with the seed laboratory in charge of Mr. Tervet.

It may be noted here that nearly all of our work is carried on with the cooperation of other offices. In the studies of diseases the investigations are conducted in cooperation with the offices charged with the carrying on of disease investigations proper. We are merely taking up special problems as they arise in obscure points.

The next project is a physiological study of the chestnut tree in its relation to the chestnut blight. That is an attempt to get information to answer the question as to why some chestnuts, particularly Asiatic chestnuts, are reasonably immune to this disease and why our native chestnuts are so susceptible. If we can find out what it is that gives to our native chestnut its susceptibility and in what the immunity of the Asiatic chestnut lies, it perhaps would open the door to a better understanding of this whole question of immunity to disease. I do not mean that the chestnut situation covers the entire question, because immunity in many cases depends on the size of the breathing pores of the plant, through which the fungi ordinarily get in, and in part on other mechanical conditions. In some cases it seems very probable that the immunity lies in the peculiar constitution of the living plant substance and its ability to resist attack. In the same way, we are not susceptible ourselves to certain animal diseases but are susceptible to others, which is not due to the fact, probably, that the disease germs can not get into us, but to the successful manner in which our organisms are able to fight them.

Our last project is miscellaneous investigations in plant physiology and fermentation, in which we carry on small beginnings of work—things which have not yet assumed an importance justifying the making of a formal project on them; but it secures to us authority to carry on, in a small way, exploratory studies on many subjects. We are at present carrying on some work along the line of the resistance of plants to frost; why, for example, some plants will succumb to frost under some conditions and why others will not. It seems as though it is likely to come down to a very abstruse question of biological chemistry. As the work develops, we hope we may be able to say something more specific. The line of investigation has not the characteristics of the ordinary type of investigation of frost injury in that the fundamental factors are sought in the physiology of the cell.

Among other lines of work carried on under this project may be noted that dealing with agricultural alcohol. Since there was no

ecial appropriation for it, we carried on our first investigation in s work under our general clause under instructions from the Secary. This work led to the sending of a representative from our ce abroad. The information brought back was published in a letin by Dr. Kremers on denatured alcohol in Germany, published year. That work at present is in an inactive state.

There are various other things which might be mentioned under s general project, but which I do not think the time will permit to discuss.

Mr. HAUGEN. Have you ever given any attention to toxic poison in rnstalks which affects animals?

Dr. TRUE. In the case of moldy corn we have done so, and we have und certain types of mold to be toxic. Some will produce substances which are fatal to the animals.

Mr. HAUGEN. How about those in cornstalks?

Dr. TRUE. We have not undertaken that work, because that subject as under investigation in the Bureau of Animal Industry.

The CHAIRMAN. Dr. Taylor, I was just thinking what reason there uld be for joining up these two lines of work in one item. They em to be absolutely unrelated.

Dr. TAYLOR. The reason is, Mr. Chairman, that these two lines ve developed together to a point where it appeared advisable to fferentiate them without establishing a separate administrative it, which would involve a duplication of the clerical services and erhead expense; so the corps of workers are carried together, and s work is administered in a single administrative arrangement, hich works toward economy of administration and of the use of the erical force.

The CHAIRMAN. There is no logical reason for connecting them up, owever, except to save expense?

Dr. TAYLOR. Nothing further than the fact that they have deeloped in this way through the personal association of the members f the force, and the interchange and interrelation that exists between ertain features of the laboratory work has appeared to make that dvisable.

The CHAIRMAN. The committee will stand in recess until 3 o'clock his afternoon.

(Thereupon, at 12.15 o'clock p. m., the committee took recess until o'clock p. m.)

AFTER RECESS.

The committee reconvened at 3 o'clock p. m., pursuant to the takng of recess.

STATEMENT OF DR. NATHAN A. COBB, TECHNOLOGIST IN CHARGE OF AGRICULTURAL TECHNOLOGY, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, please take up item 82, "crop technological and fiber-plant investigations, including the study of plant-ıfesting nematodes," carrying an increase of $6,000. First, I wish ou would explain the change in language.

Dr. TAYLOR. This is the paragraph under which we do the type of work designated as our crop-technological work and also work on [illegible] than cotton—the so-called hard fibers, including [illegible] and others.

In connection with the crop-technological projects there has been under way for several years—and recently it has become evident that it is increasingly important—an investigation of the plant-infesting nematodes which Dr. Cobb has been making and which, while set forth in the projects previously, as you will find on page 182 of the *Program of Work*, it appears advisable to specifically provide for in the text of the subappropriation. Of the $6,000 increase requested, $3,000 is intended for the development of this work on the plant-infesting nematodes and $1,000 for the enlargement of the fiber-plant investigations. The projects in agricultural technology will be discussed by Dr. Cobb, who has had charge of this.

Mr. HAWLEY. Before he takes the stand, I would like to say to Dr. Taylor that, if the language which has been formerly carried in the bill was sufficient to warrant these investigations, it would save us trouble in handling the bill not to have new language inserted unless necessary to give him the proper authority.

Dr. TAYLOR. It has been sufficient for the inauguration and prosecution of the work up to this time, but the work is assuming much larger importance than previously and it has, therefore, been felt desirable to specifically cover it in order that there may be no question.

Mr. HAWLEY. Have you had any trouble getting expense accounts passed by the auditor?

Dr. TAYLOR. No, sir; but I should like to see set out in the language of the subappropriations the important features of the work. It is easier to locate them in any consideration of the bill, for one reason, and, as you will observe throughout the plant-industry appropriations, that tendency is general.

Mr. HAWLEY. All right, Doctor.

The CHAIRMAN. Dr. Cobb, proceed in your own way.

Dr. COBB. Mr. Chairman and gentlemen, as Dr. Taylor has said, this project concerning plant-infesting nematodes has taken on additional importance as the investigations have progressed. I have observed that not infrequently people are very much in the dark as to what a nematode is.

Mr. HAWLEY. I am frank to confess that I do not know.

The CHAIRMAN. I am glad you are going to discuss that.

Dr. COBB. I shall hope to clear the matter up somewhat.

Mr. HAWLEY. Is that [indicating an exhibit] one or several nematodes?

Dr. COBB. There are several thousands there. Of course, we are all familiar with the hookworm. That is a good starter in discussing this matter. The hookworm is a nematode. In our projects we have nothing to do with hookworms, however. That matter, of course, is taken care of by the Public Health Service. The nematodes with which we are concerned are the plant-infesting nematodes. Of course, there are nematodes that are parasitic in animals, causing serious diseases and losses. Our projects have nothing to do with those. Those parasitic species are all large—or most of them are large—some of them being from 3 to 6 feet long, but they are, on an

ge from half an inch to 2 or 3 inches long. Plant nematodes
l small—practically microscopic.
order that you may know something of the size and general
rance of these organisms I have brought some of the or-
ns themselves. There is enough to this exhibit to give you
idea of the size of these organisms, and just a glance at them
hat is essential. However, these I am showing are giants of
ind; most of the species are not more than half or a fourth
t size.
ing in mind, Mr. Chairman, your desire for brevity, I have
it of the advisability of placing before each member of the
ttee a pamphlet which covers the subject, and if each puts
these in his pocket a moment may perhaps be found to look
t some more convenient time. The pamphlet covers the sub-
an understandable way and will save the time of the com-
here.
OVERMYER. The 1914 Yearbook had an extensive article on
bject; did it not?
COBB. This is the same article. While this pamphlet is being
of I will say that the Secretary has approved this pamphlet
placed in the hands of every undergraduate student of a
ical course in the United States, the idea being to encourage
owth of what is practically, as the wording of the Program
ork says, a new science. Strictly speaking, it is not new.
ly the knowledge of nematodes antedates history. It appears
e are at a point of departure of a new growth, however, in
to our knowledge of nematodes. Already the indications are
veral colleges will at once introduce courses in their institu-
lirectly bearing on these plant-infesting nematodes.
CHAIRMAN. This little animal, then, is really the plant hook-

COBB. I will speak presently, Mr. Chairman, of a nematode
tic in plants that might very appropriately be called the
orm of agriculture. It occupies about the same geographical
at the hookworm does, but of course can not be regarded in
ous a light, because the hookworm is a parasite of man and the
of a most serious disease. But I have some doubt, if careful
gation could be made, whether this gall worm—that is the
n name of this plant parasite—is not the cause of greater
ltural losses than any other single pest in its area.
CHAIRMAN. How long has this nematode been known?
COBB. Off and on for 25 years or more. The way it attacks
as been partly known and more or less has been found out
remedial measures; probably more with regard to this species
thers. Fortunately we are in a position to recommend many
l methods that will do for this pest what can be done with
l weevil; that is, the losses can be minimized.
CHAIRMAN. What are the methods?
COBB. They consist largely of suitable rotations. This par-
species is popularly known as the gall worm on account of
ing abnormal swellings in the roots of plants.
CHAIRMAN. What is this plant [indicating exhibit]?
COBB. That is a beet infested by gall worms. This pest, how-
ttacks more than 400 different species of plants. With the

great majority of our crops it is a very serious pest, sometimes ruining the crop.

Mr. WILSON. Does it attack the plants in the north, as well as in the southern sections?

Dr. COBB. Yes, sir; but it is more serious in the South. It is found more generally in the warm temperate regions than in the north temperate regions. It caused great anxiety to the potato growers in Nevada about two years ago. It is very serious oftentimes in greenhouses. We receive a great number of letters from northern States asking what should be done in order to clear the greenhouses of this pest.

Mr. HAWLEY. It remains in the soil?

Dr. COBB. Yes, sir; it never attacks the above-ground parts of the plants. It always attacks the roots. This sample which I have shown you is a sample of a plant that survived. The losses, however, are very largely in the plants that never grow. We are in the position, in regard to this particular pest, that we were 25 years ago in regard to the house fly. We did not at all realize what was the economic significance of the house fly. Even now, in my opinion, we are only just beginning to understand. We are in the same position with regard to this pest, which takes its toll every year to the extent of millions of dollars. Often people do not even know that it exists. Oftentimes they fail to get yields and do not realize that it is due to this pest.

Mr. HELGESEN. Does extreme cold minimize this pest?

Dr. COBB. Yes, sir.

Mr. HELGESEN. There is some compensation, then, in living in a country where the temperature reaches 40° below zero.

Mr. HAWLEY. Where it freezes 10 feet below the surface and kills them.

The CHAIRMAN. Has any study been made of the relationship of this thing here to the hookworm of man?

Dr. COBB. I do not think there is any relationship. Sufficient investigation has been made to show there is no relationship. It is an entirely different pest. Nematodes are as different among themselves as insects. In fact, it has now become quite apparent that the number of nematode species runs to hundreds of thousands. It is quite certain there are hundreds of thousands, and among them, of course, there are very great variations, just as in other groups.

Mr. HAWLEY. Then, you will have a multitude of different methods of working with them?

Dr. COBB. Yes, sir; I can speak with perhaps a little more authority on that subject than otherwise because of the fact that in the employment of a foreign Government I had charge of animal parasite projects of this character, so that I am conversant with the methods of combating these pests in connection with animals.

Mr. HELGESEN. You do not mean to say there are as many different methods of dealing with this pest as there are kinds? There are not a hundred thousand different methods?

Dr. COBB. Oh, no. What I meant to say was that the methods employed in combating animal parasites are completely different from the methods employed in combating plant parasites.

Mr. HAWLEY. You spoke about hundreds of thousands of nematodes. Will one method of eradicating nematodes or minimizing

this loss be adaptable in minimizing the loss of every one of these one hundred thousand kinds?

Dr. COBB. No, sir; but there are certain things, of course, that apply to a considerable number. It is very much the same as it is with insects. You can not devise any one method that will cover all cases. At the same time, it is often true that a method applicable in one case will apply in another case, with slight modifications.

In order that you may have a clear idea of what this pest is like, I have some colored illustrations here.

(The illustrations, lantern slides, were exhibited to the members of the committee.)

Dr. COBB. I have often thought, Mr Chairman, that a projection outfit in these committee rooms would be of great help in discussing these matters.

Mr. OVERMYER. I think if they would show films of some of these things, instead of the films we have to look at in the moving-picture shows, we would be better off.

Dr. COBB. These enlargements give you an idea of the organization of the nematode, and you will see at once that a nematode is a complex organism. Although it is very small, it is not to be compared with microbes and other things of that sort in simplicity. It is really comparatively highly organized. We have been speaking of these gall worms. The gall worm is one of the best known plant-infesting nematodes, because it will attack over 400 different species of plants and is very widespread. As a rule, the law with the nematodes is the same as with insects; a given species does not attack widely different plants. A nematode, as a rule, will confine its attacks to one plant or a few plants of similar character. This gall worm, however, is an exception in that respect.

Another nematode that we are beginning to deal with, which is of very great importance to the agricultural interests of this country, is the sugar-beet nematode. That is a nematode which has been known in Europe for a generation or two and not infrequently has completely stopped the cultivation of the sugar beet in various areas in Europe. In various parts of Europe at times the land has become so thoroughly infested with the nematode that it has become unprofitable to raise the sugar beet. It has been introduced, in some way, in this country. We believe it has come through on sugar-beet seeds. We are investigating to see what the probabilities are in this respect. We know that four other kinds of nematodes have been introduced in the beet seeds. Thus far we have not been able to find a live sugar-beet nematode on any sugar-beet seeds; we have, however, found dead ones. As soon as we definitely arrive at the facts in this matter, we will have information on which to predicate any action we may wish to take in regard to the sugar-beet nematode. It seems to me probable that some method can be devised by which beet seed can be sterilized, but it is too early to say definitely. It is known that hot water, which is not sufficiently hot to kill the seeds, will kill nematodes. We have many careful demonstrations to cover that.

Now, the sugar-beet growers are very apprehensive in regard to this sugar-beet nematode. It has appeared in various regions in this country where the sugar beet is grown, and the department is beset oftentimes with letters and telegrams asking what to do. In this case we are also in a position of making recommendations of a practical nature. These investigations are carried out in connection with

other offices and bureaus that deal particularly with the crop that is infested. A question was asked in regard to methods. In most of these cases an ounce of prevention is worth a pound of cure. That is particularly so with the sugar-beet nematode. It is now on a limited area, but there is every reason to suppose, from the rate at which it has been spreading, that, unless measures are taken to decrease this rate, the losses will be much more serious than now; and it is by warning people with regard to the presence of these pests, how they are introduced, what they can do when they are first introduced to stamp them out, if possible, that we help to apply the ounce of prevention that is worth the pound of cure. That, however, is not at all applicable to gall worms. I presume, if everything in the country except gall worms were wiped out, many regions in the southern part of the country would be more or less recognizable. There is such a volume of these nematodes that there would be left a film of them sufficiently definite to identify the country.

The CHAIRMAN. I suggest that you do not take too much time on that feature. I think you have given us a very good idea of the matter.

Dr. COBB. The desire is to make these investigations more complete and comprehensive. A very interesting feature of those investigations, which will illustrate what is meant, is the discovery during the last two years of predaceous nematodes. Some of the slides which were sent around to the members of the committee will give an idea of this feature of the work. There are nematodes that feed on other nematodes. Just as the entomologists consider that one of the most efficient ways of fighting an insect pest is to set another insect to feeding on it, so it is in this case. We have found a number of predaceous nematodes that feed on other nematodes, and I am free to say from the number of discoveries we have made along this line that the number of predaceous nematodes is great. This matter should be studied carefully and methods devised for using them.

Mr. HAWLEY. These predaceous ones are not agricultural pests themselves, are they?

Dr. COBB. No, sir. Just to show the way in which we discover some of these things I will state that not long ago we had occasion to find that the nematodes in the Washington filtered water were unusually abundant. We knew that most potable water contains a certain number of nematodes, but it became apparent that there were more than usual in the Washington water. We discovered this, and we went to the filter beds and discovered that in the beds there were hundreds of millions per acre. This is not peculiar to the city of Washington; it is the same in other cities. The majority of the nematodes that we discovered there proved to be predaceous, feeding on living organisms, and one of them is one that has hitherto been known only in connection with soils. It evidently can stand aquatic conditions and sometimes occurs in almost pure culture in the filter beds. So it has occurred to us to get some of the sand out of the filter beds and grow some of these predaceous nematodes for use in connection with the nematode-infested lands. That is being carried out. That is one of the lines of work that is contemplated in this appropriation.

Mr. HELGESEN. Have you gotten any results from that?

r. Cobb. We have results of a kind. This pamphlet of which have copies, and which later on you may have a chance to read, that in California a nematode attacks citrus roots and is a requiring serious attention. With it, and feeding on it, and the orchardist a good turn, is one of these predaceous nema-
These discoveries were made only a few months ago. We that this particular species in the filter beds has fallen off con-bly in numbers during the winter. It is beginning to come So we have no doubt of our ability sooner or later to get of them to test them practically.

e Chairman. I forgot to ask you how you suggested using 5,000 in extending the work?

r. Cobb. Along the lines outlined.

e Chairman. Do you expect to employ one or two additional

r. Cobb. That is what the main expenditure would be—additional tance.

ie Chairman. Now take up the fiber technological studies.

r. Cobb. This work is on a different basis than heretofore. The ological work hitherto included in this office has been trans-d to the Office of Markets and Rural Organization, and the that is now being done has related very largely to the study bers, especially of cotton, in regard to their fundamental prop-—the properties that give them their use in the industry; and ork that has been done has proved of interest to the industry, own by requests on the part of the industry that the results be nted to them at special meetings. This course was permitted e Secretary of Agriculture, and the results have been presented arious meetings at their own expense. Studies of methods rmining the length of the staple are being carried on—new ıods, different from those employed hitherto; the relationship trength of the fiber to the plant on which it grows, at different ons, and under different methods of treatment, is being studied. effect of the form of the fiber on its spinning qualities is being ied. That is a very important line of work, about which com-ıtively little is known. These studies are fundamental, and the stigations, so far as this feature of them is concerned, are in a which all work that ever comes to any fruition has to pass ugh; that is to say, they are being misunderstood, or misappre-led, because they are undertaken from a new viewpoint and in cases contradict what are considered to be facts in the indus-
That is a not uncommon feature of investigational work. These icular investigations seem to be in that position just now. I have loubt personally of the value of that sort of work and believe er or later it will come to be understood. It is like the work that True has mentioned this morning; it can hardly be expected to be ıce thoroughly understood, although it may be very important.

ıe Chairman. Doctor, do you not handle the cotton grades any ?

r. Cobb. No, sir.

ıe Chairman. This is really a technical scientific study of the n fiber, is it not?

r. Cobb. Yes, sir.

The CHAIRMAN. All right, sir; take up your next item—laboratory and field equipment.

Mr. WILSON. Just a minute, Mr. Chairman. I notice here in reading this note that there is a proposed increase of $1,000 for fiber-plant investigations in connection with sisal. At some time or other I would like to have somebody from the department tell us what they know about the sisal situation.

Dr. TAYLOR. Mr. Dewey will discuss that.

Dr. COBB. This has to do with the improvement of apparatus and machinery in a general way. Perhaps the work may be best described by giving an illustration. It not infrequently happens that our people have field problems in connection with cultivation or reaping or some agricultural operation, and they are not unlikely to come to this office with the facts and ask for suggestions. If the matter seems promising, sometimes we go ahead and develop a machine suitable for certain purposes. That has been done in several cases, and the machines have been more or less successful—generally sufficiently successful to justify the expenditure and sometimes very much more than that. The project also relates to a good deal of internal work of the bureau, connected with the improvement of scientific instruments and apparatus.

The CHAIRMAN. All right, Doctor; anything further?

Mr. HELGESEN. What did you say the machines were for?

Dr. COBB. One, for example, is for removing a certain portion of the bulbs of tulips and similar plants, in order that they may be propagated to better advantage. That operation was formerly done by hand. We were able to devise a machine that will do it more rapidly and give a better quality of work. We are also working on a machine for harvesting clover seed.

The CHAIRMAN. Does that complete your statement?

Dr. COBB. Yes, sir.

The CHAIRMAN. We are very much obliged to you. Now, Dr. Dewey, will you take up the next subject?

STATEMENT OF MR. L. H. DEWEY, BOTANIST IN CHARGE OF FIBER-PLANT INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

Dr. TAYLOR. Mr. Dewey will be the next speaker. The fiber-plant investigations projects, on page 134 of the Program of Work, deals with what we call the long fibers, in distinction from cotton.

Mr. DEWEY. Mr. Chairman and gentlemen of the committee, the work of the Office of Fiber Plant Investigations includes, in the first place, the dissemination of information regarding the hard fibers—sisal, henequen, and Manila fiber—used in the manufacture of twine and coarse cordage; the soft fibers, such as hemp, flax, and jute; also stiff fibers like ixtle and similar fibers used in making brushes; other fibers used in the making of hats and matting; and stuffing fibers like kapok. Most of these fibers must be grown in the Tropics. The importations of raw fibers for manufacture amount to $40,000,000 or $50,000,000 annually.

Mr. WILSON. Do you include the importations from the Philippines and the Hawaiian Islands?

Mr. DEWEY. Yes, sir; lippines and small quantities of sal from Hawaii. C production, excluding Hawaii and the Philippines, al... so ... y from $1,000,000 to $2,000,000 per ar and is confined exclusively to hemp and flax, which are the ly fibers in these groups grown within the continental United tates. The conditions in this country are as favorable as abroad r the production of flax and hemp, and the conditions in some of he island possessions are favo le for the production of henequen, sal, and similar hard fibers. Our work has been devoted chiefly hemp and flax, because thos e the two fibers that we can grow re. The first project in th rrogram of Work deals with sisal, nequen, and allied plants. You will the names sisal and nequen, indicating that they are dif plants. They are two tinct plants. We have here in t u photograph [exhibiting] illustration of the true hen vi in Yucatan. In the o lower photographs [exhi are ie sisal plants, closely lied to henequen, and very simi in p ographs, but botanally different and economically y dine . They require different conditions for their best development. They produce a different quality of fiber and are sold on the market at different prices. The name sisal is commonly used to include not only henequen fiber rom Yucatan but also the true sisal fiber produced in tropical East frica, the Bahamas, Java, and India. Our importations of henequen ber, amounting to from $16,000,000 to $22,000,000 annually, come hiefly from Yucatan, because Yucatan produces more than nineenths of the henequen fiber of the world. Henequen fiber is priarily a fiber from which binder twine is made. Eighty per cent f the binder twine of the world is made from this fiber, which is roduced on more than 500,000 acres of land in the State of Yucatan. maller quantities are produced in the States of Campeche, Chiapas, nd Sinaloa, in Mexico and in northern Cuba. But the amount produced in Cuba is not enough to supply their own cordage mills, so hat Cuba imports fiber of this same kind from Yucatan.

Mr. STEELE. Are there any bugs that attack these plants?

Mr. DEWEY. None that are serious. There is one beetle in Yucatan hat causes some injury. There is one disease, the black rot, that auses some damage.

Mr. STEELE. Then it would be safe for me to invest in the sisal ields in Mexico?

Mr. DEWEY. Conditions, of course, are abnormal, especially in Yucatan.

Mr. WILSON. Tell us something, if you can, about the charge that as been made recently that a monopoly exists in the production of isal in Yucatan.

Mr. DEWEY. It is reported, apparently on good authority, that here is a State monopoly of henequen in Yucatan. The orders f the State of Yucatan, as recently promulgated by Gov. Alvarado, re such that the monopoly is perhaps as stringent as the monopoly f camphor is in Japan. All henequen in Yucatan, according to these ws, must pass through the hands of the Commission Regularoda del ercado de Henequen in Yucatan.

Mr. WILSON. What possibility is there to meet that situation by ie growing of plants in Hawaii, the Philippines, or Porto Rico?

Mr. DEWEY. There are thousands of acres in Hawaii where the conditions are favorable for the production of sisal. We know, in fact, that there are three sisal plantations—not henequen, but sisal plantations—now in operation in Hawaii, and there are areas in the island of Hawaii and also in Molakai that may be favorable for the production of henequen. The henequen plant of Yucatan has not grown as well in Hawaii as the sisal plant. The same is true in Porto Rico. We have grown in Porto Rico not only henequen and sisal but many other promising plants of the group.

Mr. HAWLEY. Is the requirement one of soil or climate?

Mr. DEWEY. It is combined soil and climate. Henequen requires a limestone soil—a porous soil which will drain quickly—and a warm tropical climate, without frost at any time of the year.

Mr. WILSON. Are these plants perennial?

Mr. DEWEY. They are perennial. They are propagated by suckers—that is, young plants growing from the old plants—which are shown in the photographs [exhibiting]. In Yucatan these are set out at distances of about 2 meters, or 7 feet, apart in each direction, and the soil is mostly so stony that it can not be cultivated as we cultivate in this country, but the weeds must be cut down by machetes. The first crop is harvested in six or seven years after the crop is set out. In Campeche the first crop is harvested in the fourth or fifth year.

Mr. WILSON. If it takes seven years for the plant to attain a growth sufficient to permit of cutting the leaves, there is not immediate prospect of meeting the Yucatan situation, is there?

Mr. DEWEY. Not by immediate cultivation of the plant: no.

Mr. WILSON. Is there any other method of meeting it that you have to suggest?

Mr. DEWEY. What the Department of Agriculture can do to best advantage is to conduct investigations and field experiments to demonstrate that the plants can be grown successfully in Hawaii, on other soils than where they have already been tried, and still further, to carry on work in Porto Rico in the development of improved varieties. Nothing has ever been done with either henequen or sisal—until within the past two years in the Philippines—or with any hard-fiber plant with a view to improving varieties, as has been done with corn in this country or as we are doing with flax and hemp in this country at the present time.

Mr. WILSON. What is the commercial value of henequen, sisal, and Manila?

Mr. DEWEY. At the present time henequen is quoted in the New York market at 7¼ cents f. o. b. New York. Sisal from Java is quoted at 9, and has been quoted at 9 most of the time during the last eight months. Bahama sisal is quoted at from 7 to 8 for the machine-cleaned, and 5 to 6 for the hand-cleaned. The Hawaiian sisal is sold in a special market at only about 6 cents per pound, unless it has gone up recently.

Mr. HAWLEY. How about Yucatan?

Mr. DEWEY. Yucatan henequen is quoted at 7¼ cents at the present time. It has gone up from 5¼ cents since the order of the Yucatan Commission has gone into effect. It has gone up 2 cents since the commission began to control the market.

ELGESEN. Have you carried on any experiments in the making
from flax straw?
EWEY. This department has not, but a commercial organiza-
made experiments; it has spent more money than the depart-
uld spend in decades and has proved very definitely that twine
be made from flax straw so as to compete with the hard fibers.
the soft fibers are suitable for binder twine.
HAIRMAN. Have your investigations gone far enough to make
eve that these several things could be grown at a profit, as
d with other crops grown in the community and neigh-
?
EWEY. Not on the same soils. Considering the vital question
.ve profits in Hawaii, especially as between sugar and hene-
nequen can not be grown on the same kind of land on which
grown. Sugar requires a moist land and deep arable soil.
n requires a dry and stony soil that will permit water to go
quickly.
HAIRMAN. In other words, it will grow on the kind of land
not be used for any other purpose?
EWEY. Yes, sir.
HAIRMAN. And to that extent would be profitable?
EWEY. Yes, sir; it is profitable.
HAIRMAN. Is it the purpose of the department to crossbreed
nts so as to make them hardy and replant them in this
? Do you think that could be done?
EWEY. I regard it as extremely improbable that any fiber-
g agave can be cultivated economically within continental
States. The most promising area is probably in southern
ia. The experiments we have conducted thus far in south-
as have not yielded very promising results. In southern
there are no areas of exactly the right conditions large
to give much promise of success. The sisal or henequen
requires an area of at least 2,000 acres, and preferably
eas, under one management.
AWLEY. Two thousand acres?
EWEY. Yes, sir. It is something like the sugar industry.
es a large machine that will clean from 5,000 to 10,000 leaves
ur, and there must be a sufficient quantity of the leaves to
machine in operation.
EELE. I was wondering, if it can not be grown in this coun-
t is the purpose, or what do you expect to do to benefit the
wine industry? That is the thought I had. I do not know
you got my thought. What purpose would you have in this
iation to benefit the consumer of binder twine if this is
nly outside of our country, in Porto Rico and Hawaii?
uld you help the industry?
EWEY. By improving the variety of plants to secure a greater
on of fiber than the plants yield at the present time. It is
hat the leaves of some plants will yield 2½ per cent of fiber,
r plants under exactly the same conditions will yield 5 or 6
of fiber. If we can get a plant 2½ or even 1 per cent more
average, it may make the difference between profit and loss.
r sells at the present time in Yucatan at about 2 cents gold,
s Mexican, per pound as it leaves the plantation.

Mr. OVERMYER. Is American capital interested in the production of sisal in Yucatan?

Mr. DEWEY. No, sir; the haciendas are all owned, or have been, by Yucatecans.

Mr. STEELE. If, as the result of your work, it did increase its production, and the trust had control of it, that would not result in a decrease in price to our consumers, would it?

Mr. DEWEY. If it came from regions other than Yucatan, the trust could scarcely control it.

Mr. OVERMYER. We have no way of regulating what Yucatan does in reference to the exportation of this product?

Mr. DEWEY. No; not that I know of.

Mr. WILSON. I have had protests from some of my constituents in regard to this proposition. If I understand your proposition correctly, there is nothing we can do at this time to prohibit a monopoly in Yucatan?

Dr. TAYLOR. Not unless the matter can be reached at t his end by producing it ourselves.

Mr. WILSON. It seems to me we used to get a twine called manila.

Mr. DEWEY. Yes, sir; perhaps about 18 per cent of the binder twine used is manila. At the present time manila is very high, owing to two or three successive typhoons and the high freight rates.

Mr. WILSON. To what extent might this manila take the place of or come into competition with sisal, if the price on sisal continues to increase?

Mr. DEWEY. If the prices continue to increase in Yucatan, with henequen, say, at 8 cents a pound and the manila grades ordinarily used for binder twine at 8½ cents to 9 cents per pound, it might compete.

Mr. WILSON. This manila makes a better twine than sisal, does it not?

Mr. DEWEY. Manila is used to make the 600 to 650 feet twine, while sisal makes 500 to 550 feet twine.

Mr. HAWLEY. To the pound?

Mr. DEWEY. Yes, sir.

Mr. WILSON. Is there substantially the same limitation on the production of manila as sisal?

Mr. DEWEY. Practically. The abacá plant—that is the name used in the Philippines and is really the name which should be used for the plant and fiber—is cultivated only in the Philippines and Java. Attempts have been made without success to cultivate it elsewhere. Practically all the abacá fiber is cleaned by hand. Nearly all sisal is cleaned by machines. Hand cleaning prevents the ready introduction of this industry into new localities.

Mr. HAWLEY. Could not this be cleaned by machinery?

Mr. DEWEY. No machines have been devised thus far which do the work efficiently.

Dr. TAYLOR. Could the production of abacá in the Philippines be increased rapidly enough to meet a shortage of henequen?

Mr. DEWEY. Abacá will yield its first crop 18 to 24 months after the suckers are put out. From the present outlook there is nothing of advantage to be derived from abacá during the coming year. It does not look as if there will be a large quantity of abacá during the coming year. The most recent reports indicate a decrease.

r. HELGESEN. Are the areas in the Philippines of a sufficient size roduce manila and be increased to an extent that will hold the r in check, providing it gets too high?
r. DEWEY. Provided the conditions are favorable for the introion of capital to carry on the work; yes.
:. STEELE. Those fellows do not work. They have the area and l produce a sufficient quantity if they were industrious?
:. DEWEY. Yes, sir; the best abacá is produced in Mindanao, in outhern part of the Philippines, where the present area under vation is very small. It could be cultivated very largely there. á requires a hot, moist climate and grows best on volcanic soil, e the conditions are very different from the conditions necesfor henequen or sisal.
e CHAIRMAN. All right, Doctor; take up the next line of investiins, flax fiber production.
r. DEWEY. Flax is produced in this country only in eastern Michiand, during the past year, in Oregon. There were about 1,600 s of fiber flax grown in Michigan and 400 in Oregon, making al of 2,000 acres. This, of course, is fiber flax, and not seed flax. y are very distinct.
r. LEE. Don't they grow some in Kentucky?
r. DEWEY. No, sir; except possibly a small amount of seed flax.
r. STEELE. Is that like the other flax, where it must be grown on ground? Can it be grown on old ground?
r. DEWEY. All fiber flax in the United States is grown on old nd? It is merely a different horticultural variety of flax.
r. HELGESEN. As a matter of fact, the theory that any flax must rown on new soil is not correct?
r. DEWEY. No, sir; it is not.
r. HELGESEN. If you can eradicate the diseases, you can raise flax where?
r. DEWEY. Yes, sir; and by rotation you can escape the disease. s has been grown in Europe on land used for centures by merely owing rotation.
r. WILSON. What is the difference between fiber flax and seed ?
r. DEWEY. Fiber flax is a tall, slender plant with very few bolls. seed flax is a short, coarse plant with many branches and many bolls. The fiber plants require a moist soil and moist climate. seed flax can be grown where there is as little moisture as is ssary for wheat.
r. WILSON. There was a concern in Chicago, which carried on, ugh contracts with the farmers in my district, quite a large flax stry some years ago. I understood at the time that the flax was g raised for fiber purposes.
r. DEWEY. Some fiber flax has been raised in Wisconsin and in eastern Minnesota, but not during the past year.
r. WILSON. Do you know why it was discontinued?
:. DEWEY. Lack of capital, I think.
:. WILSON. Do they make binder twine out of flax?
:. DEWEY. Not at the present time. It was made for several at St. Paul.
:. WILSON. What kind of fiber are they using for the binder which they are making in the penitentiaries?

Mr. DEWEY. Abacá and sisal.

Mr. REILLY. Are not the farmers in my district raising some hemp?

Mr. DEWEY. Some hemp; yes, sir.

Mr. REILLY. Can not they compete with the Yucatan products?

Mr. DEWEY. No, sir; none of the soft fibers can be used successfully for the making of binder twine. It does not make twine that will work successfully in the binders. That is the reason the industry of flax binder twine in Minnesota was discontinued.

Mr. REILLY. I have received several letters from farmers growing hemp, and they are kicking about the machine end of it. They claim that these companies hold them up so that it is not profitable. They say they charge them so much per pound. They will not sell the machine, but insist on renting it at so much per pound. The farmers do not want to raise the crops because they do not know how much they will be held up by these people owning the machines.

Mr. LEE. Why can't they use cotton for binder twine?

Mr. DEWEY. It is because of the trouble they have in the machines. The binder device, as you know, has a little needle that goes around and comes up in making a knot, and the soft fiber clings around it, causing a great deal of troble with the machine. The hard fiber does not have the clinging and adhering properties of flax, hemp, jute, or cotton, and the loop slips off from the needle readily.

Mr. LEE. The fiber you are talking about is used to make linen, is it not?

Mr. DEWEY. Yes, sir; there are about 20 mills in this country using flax for the manufacture of linen threads, twines, and crash.

Mr. LEE. Then, in the finished product, it is a higher-priced goods than the cotton goods?

Mr. DEWEY. Yes, sir; and flax at the present time is abnormally higher. The average import price this past year for flax fiber has been $399 per ton. Russia produces about 80 per cent of the flax of the world. Most of the fiber has been imported from Russia.

Mr. WILSON. Have you arrived at any conclusion as to the advisability and practicability of raising fiber flax in this country?

Mr. DEWEY. Yes, sir; it can be raised successfully and profitably in eastern Michigan, and there are many areas in Wisconsin, Minnesota, and probably along the river valleys, even in the Dakotas, suitable for fiber flax. It can not be raised where the conditions are dry. It requires a moist climate. The best flax in the United States is produced in the Willamette Valley in Oregon.

Mr. HAUGEN. What are your suggestions as to proper rotation?

Mr. DEWEY. Rotation with almost any other farm crop, using flax only about once in seven years on the same soil. The work we are doing with flax is chiefly along the lines of developing improved varieties. The lower picture [exhibiting] will show an improved variety that we have developed. It has been held for years by flax growers in the United States that fiber flax can not be grown from American-grown seeds. We have demonstrated in our experiments that seed produced in this country is not only equal but superior to that imported, and we are developing improved strains of flax. Nothing along the line of developing improved strains has been undertaken until within the past few years.

T[illegible]IRMAN. The next item is hemp fiber production.

Mr. DEWEY. During the past year there were about 8,800 acres of hemp grown in the United States. About 7,000 acres were grown in Kentucky and the remainder in Ohio, Indiana, Wisconsin, and California. The work in Wisconsin is largely the result of cooperation between our office and the Wisconsin Experiment Station, and the cultivation of hemp is becoming practically established in eastern Wisconsin. The conditions are favorable for the production of hemp through the greater portion of the area west of the Alleghenies and from Kentucky and Arkansas northward and west as far as the Missouri Valley.

Mr. WILSON. I should like to ask one or two questions, if I may, on the flax proposition. Is the raising of flax fiber which will produce a reasonable crop of seed practicable? Are the two propositions inconsistent—fiber and seed plants?

Mr. DEWEY. Not at all. Seed is saved from the fiber crop in all countries except Ireland and Japan. It is not saved there for the reason that the seed does not all mature at one time. In Belgium, where the best flax is produced, the seeds are almost always saved.

Mr. WILSON. Does the horticultural method adopted for the raising of fiber flax result in a smaller yield of seed?

Mr. DEWEY. It does. The yield from seed flax is from 8 to 20 bushels per acre. The yield from fiber flax ranges from 4 to 10 bushels per acre.

The CHAIRMAN. All right, Doctor, take up hemp, the next item.

Mr. DEWEY. We are working toward the development of improved varieties, and by this photograph [exhibiting] you will see the result of development of an improved variety, extending over the past three years, the first selection being 9 feet high; the second year, the plant being 12 feet high; and the third year, 14 feet high.

Mr. HELGESEN. Is this flax?

Mr. DEWEY. Hemp.

The CHAIRMAN. How extensive is the hemp area in the United States?

Mr. DEWEY. Last year about 7,000 acres in Kentucky, about 400 acres in Ohio, 400 or 500 acres in northern Indiana, about 400 or 500 acres in Wisconsin, and about 400 or 500 acres in California.

The CHAIRMAN. Does it require a peculiar kind of soil?

Mr. DEWEY. Well, an abundance of limestone. In that respect it is different from flax. Hemp requires an abundance of lime.

The CHAIRMAN. Hemp, I presume, would grow well in the bluegrass section of Kentucky?

Mr. DEWEY. The bluegrass section of Kentucky is the primary hemp section of the country. It may be grown anywhere where bluegrass grows well.

The CHAIRMAN. What about climatic conditions?

Mr. DEWEY. It requires a fair amount of rainfall, more moisture than is necessary for wheat or corn, and a rich, deep soil, because it makes a tremendous growth and is as thick as wheat.

The CHAIRMAN. Is it essentially a tropical plant?

Mr. DEWEY. No, sir; it can not be grown in the Tropics successfully.

The CHAIRMAN. Then, as I understand it, it is grown in about this latitude?

Mr. DEWEY. Yes, sir; the hemp in this illustration [exhibiting] was grown at Washington.

Mr. WILSON. Is it affected by frost?

Mr. DEWEY. A little less than oats. The matured hemp plan will endure much more frost than corn.

The CHAIRMAN. Your line of work is to try to breed better plan to start with?

Mr. DEWEY. Yes, sir.

The CHAIRMAN. And you are making a number of experiments the use of fertilizers?

Mr. DEWEY. Yes, sir; we have carried on experiments in northe Indiana during the past two years along that line. I may st that last year in Kentucky more that 70 per cent of the crop seed hemp was from our improved varieties. This year we will ha seed sufficient to furnish the hemp-seed growers enough seed for least 200 acres of seed hemp.

Mr. LEE. How do you treat the hemp plant so as to get fiber?

Mr. DEWEY. It is harvested with an ordinary self-raking reap laid on the ground and retted. All hemp is dew-retted in Ameri It is not water-retted. It is broken by hand in Kentucky and the other States by machine brakes. We regard the machine essential for the development of an extensive industry. I do n believe it can develop on the old hand brakes.

Mr. HEFLIN. I was in Kentucky last fall and saw great shocks it in the field to be exposed in the weather.

Mr. HEFLIN. They lay it on the ground to rot?

Mr. DEWEY. Yes, sir.

Mr. HEFLIN. I think it injures the fiber. I should think it wou be a great idea if you could get hold of some machines to break up so that the fiber would not be injured. I broke up some of and got hold of some of the fiber, and it seemed to me to have be injured. That is the process they go through with before they g the fiber?

Mr. DEWEY. That is the most inexpensive way that has been d covered for doing the work. In Italy and most of Russia the he is water-retted, but that is too expensive for American labor.

The CHAIRMAN. Now, Doctor, take up your project on ram fiber production.

Mr. DEWEY. That can be passed over quickly. That has be held in abeyance. Our experiments have shown that ramie can n be produced in this country at a cost to compete with the ha cleaned ramie introduced from abroad, even if the price w doubled.

The CHAIRMAN. You are spending only $160.

Mr. DEWEY. That is chiefly in answering correspondence of peo who have been approached by promoters for investment in the ra proposition and who write in for information. There is lots money in it, because lots of money has been put in it and not tal out. [Laughter.]

The miscellaneous fiber investigations include chiefly the secur of information regarding different kinds of fibers, in addition those that are specifically mentioned under our main projects. receive requests for information about these various fibers and s requests for information concerning certain well-known plants, s

milkweeds, the so-called Indian hemp, etc. It is necessary, of urse, to have up-to-date information regarding these.

The CHAIRMAN. I see you make the statement, in the program book, More than 2,000 letters asking about fiber plants of minor impor- ce answered each year; more information about fiber plants on e than anywhere else in the world." Is that true?

Mr. DEWEY. I think that is true.

The CHAIRMAN. Does that complete your statement?

Mr. DEWEY. There is only one other statement I wish to make regard to miscellaneous fibers. During the past year we were ked to investigate the question of the raising of teazels in this untry. All broadcloth is still finished by teazel burs. The finer ades of ladies' broadcloth must be finished with the French teazels, type of teazel not grown in America. The price of this at present very high, and the indications are that it is likely to be higher; d our office is conducting investigations with a view to developing type of teazel which can be grown profitably in the United States ith a cost that will permit it to compete with the French teazels. ou are probably familiar with the wild teazel plant abundantly troduced in this country and especially abundant from southern lichigan to Tennessee. It grows chiefly in heavy clay soils. It is metimes regarded as a weed. The cultivated teazel is something ke that, having a bur shaped like an egg, with small hooked spines. hese are set in the machines and comb the cloth, to bring up the ap, so as to give that finish which you have all noticed in broad- loth goods.

The CHAIRMAN. Is there any common name for that teazel?

Mr. DEWEY. Nothing, except teazel, or fuller's teazle.

Mr. HELGESEN. Is it not used for other things than broadcloth?

Mr. DEWEY. Not so much. Steel burs are used for rough woolens, ut they have not been able to find anything to take the place of eazels for broadcloth.

Mr. HELGESEN. I know it was used in the mills when I was a boy. It was most commonly used in the manufacture of coarse blankets.

STATEMENT OF DR. J. W. T. DUVEL, TECHNOLOGIST IN CHARGE OF GRAIN STANDARDIZATION, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. I believe the next item is No. 83, page 61, "For nvestigating the handling, grading, and transportation of grain, ncluding the grain sorghums, and the fixing of definite grades hereof." There is an appropriation of $109,920, to be used in cer- ain ways, which I will ask you to explain.

Dr. TAYLOR. This item includes the only large increase submitted i the estimates of the Bureau of Plant Industry and is, as the clause dicates, for what we know as grain-standardization work. It has en under way for a number of years, and under it the corn grades ive been formulated and promulgated, as was reported a year ago. he reason for including the new language, which consists of the ords "including the grain sorghums," is to make clear that it is creasingly important to study the methods of growing, storing, and ndling such farm crops as kafir, milo, and those other grain rghums that are becoming so important in the Southwest, and that ey shall be covered here. It came out during the last year, in

connection with the consideration of the contemplated legislation grain standardization, that there was doubt in some minds as whether this would be included as grain. It is desired to enlarge t work upon that group of grains, and the new language is therefo suggested.

Mr. WILSON. What kind of work is that?

Dr. TAYLOR. The investigation of the handling of these grain the storing of them, and the formulation of grades similar to t corn-grade work which was reported last year.

Mr. WILSON. Is there enough of that sort of stuff produced in t country to make it wise to establish a grade for it?

Dr. TAYLOR. Its culture is increasing very rapidly in weste Nebraska, Kansas, eastern Colorado, Oklahoma, and Texas. T grain sorghums are, to a considerable extent, taking the place corn, as safer and more reliable crops in dry seasons.

Mr. HAWLEY. What is the annual production in bushels?

Dr. TAYLOR. I can not state it offhand. We have had impress upon us, particularly during the past year, the importance of h ing definite information in regard to the manner of handling gr sorghums. They do not carry well in storage with the methods general vogue.

Mr. HAUGEN. The new language, then, is not inserted for t purpose of giving the department authority to standardize but investigate the handling, growing, and transportation, including t fixing of definite grades, to the extent there is authority here?

Dr. TAYLOR. As a matter of fact, there are so-called grades alrea in effect in Kansas City and in St. Louis, where these are very larg used.

The CHAIRMAN. Dr. Taylor, just make a very brief statement your suggestions.

Dr. TAYLOR. I will say that of the total increase $25,000 is quested for the establishment of three new laboratories similar those now maintained in Chicago, Baltimore, Portland, Ore Decatur, Ill.; Kansas City, Mo.; and New Orleans.

Mr. WILSON. What do you do in the laboratories?

Dr. TAYLOR. Would you not like to have it stated by Dr. Duv Of the remainder of the increase, $7,500 is asked for investigati of the handling, grading, and transportation of kafir, milo, a other grain sorghums, and $4,500 for a study of grain-handli methods in the Southern States, to meet the rapidly increased p duction of corn and oats.

The CHAIRMAN. Let me ask two questions before we have Duvel make his statement. I noticed last year your total app priation for this work was $86,071.65, and for the present y $72,920 is asked.

Dr. TAYLOR. The only reductions last year were the transfer places from the lump to the statutory roll.

Mr. HELGESEN. My recollection is that the committee cut the propriation for the standardization work last year.

Dr. TAYLOR. No, sir; the net amount was provided.

Mr. HELGESEN. For the estimates as made?

Dr. TAYLOR. Yes, sir.

The CHAIRMAN. As I recall it, last year you estimated for th three laboratories you are estimating for now.

Dr. TAYLOR. My recollection is that we estimated for one addi-
nal laboratory.
The CHAIRMAN. For one?
Dr. TAYLOR. Yes, sir.
The CHAIRMAN. I was inclined to think probably three.
Dr. TAYLOR. You may recall that the year before there was a pro-
on made under which the Portland laboratory was established.
he CHAIRMAN. I must have had that running through my mind.
re was the last laboratory established?
r. TAYLOR. At Portland, Oreg.
e CHAIRMAN. Where would you establish these three?
. TAYLOR. At Minneapolis or St. Paul, presumably—in the
t district—and St. Louis, probably. The location of the other—
these locations are tentative and merely suggestive—would
bly be at some lake point where the grain changes from the
to rail.
e CHAIRMAN. Dr. Duvel, please discuss this work in the order
ich the different provisions or projects appear in this program

. DUVEL. I assume this committee during the past year has
l a good deal about this work and the various phases of it, and
aps it will not be necessary to go into so much detail as some
s have been doing. The first project is the establishment of
ite grain grades on the basis of their intrinsic value. Under
we have established grades for corn which have been in use in
of the markets since July, 1914. Now, under this item our
is primarily to study the methods of handling, grading, trans-
ation, storage, etc. A good many, I think, and I fear some on
committee, have the idea that this appropriation is solely and
ly for the purpose of fixing standard grades, which is not the
Two years ago we asked for a $10,000 increase to fix standard
es for corn. That is in connection with other data we had
cted on the handling, storage, transportation, etc., and for the
nt year there is allotted $12,320 to be spent on this project to
ogether data covering——
e CHAIRMAN. Let us get that in mind, because I believe you
d it truthfully that there is some misunderstanding as to how
appropriation is used.
. DUVEL. It is our desire to clear up this matter.
w, in our work on the corn grades last year we brought in our
from the field, worked up our data, and presented the informa-
to the grain dealers at the convention of the national associa-
at New Orleans, which our men attended for that purpose. We
presented the data at a special meeting of farmers' organiza-
in Des Moines and at a special meeting at Washington, which
ved a considerable amount of trouble and expense and also an
amount of clerical labor to get all data together. These con-
ces were held to get the viewpoint of the trade before the
s were finally fixed.
e CHAIRMAN. You propose to use $12,320 in the fixing of
es?
. DUVEL. We have used that allotment so far this year to bring
her what data we have on wheat with our own office force, noti-
the members of the various grain associations to submit such

suggestions as they might desire in connection with the establishment of these grades and that we intended to have the grades established as soon as possible. We want to have things in shape so that in the event of grain-grades legislation we will have the information ready to call a conference soon after the enactment of the grain-grades or other bill and receive such information from those participating as they may be able to give us.

The CHAIRMAN. Instead of using $109,000 in the fixing of grades for grain you have been spending about $10,000 or $12,000 a year?

Dr. DUVEL. Yes, sir.

Mr. HAUGEN. Can you state definitely the amount spent in fixing grades?

Dr. DUVEL. That has been definitely put on that phase of the work. It is difficult to separate that project from other projects, because we use the data we accumulate in connection with other investigations for this purpose. On this particular project we have spent probably $50,000; that is, since we have begun to get the data together.

Mr. HAUGEN. As I understand it, we have appropriated $704,000 for this standardization work since its inauguration. How much of that has been spent in fixing grades?

Dr. DUVEL. Under this particular project probably not more than $50,000. Before we fix grades we must know something about the keeping qualities: how grain will stand up in shipment from one point to another, the amount of natural mixture in the fields, and the value of the grain of different qualities and grades. All of these come in in connection with the regular investigation, and we, of course, use the results of these investigations when it comes to fixing standards.

The CHAIRMAN. Under this project you state that during all the previous time you have spent something in the neighborhood of $50,000 in the matter of fixing grades, as such?

Dr. DUVEL. Yes, sir.

The CHAIRMAN. Does that cover what you are asking, Mr. Haugen?

Mr. HAUGEN. Yes. How much has been spent for other projects?

Dr. DUVEL. The balance would be for the investigation——

The CHAIRMAN. To investigate the grain——

Mr. HAUGEN. To investigate grain? How much money have you on that and how much have you spent?

Dr. DUVEL. I could not answer that offhand. This work is all correlated. We go into the field and study the effects of various factors on the quality and grade of grain when marketed.

Mr. HAUGEN. How much money has been spent in studying and handling grain on the farm each year?

The CHAIRMAN. Let him finish this statement and then go on to the next one. "Farm methods of harvesting and handling grain."

Mr. HAUGEN. I want to know the amount expended, why it was expended, and the results. I suggest, however, you go through with your program and give that later.

The CHAIRMAN. I am through with that item myself.

Mr. HAUGEN. I just had a few questions.

Dr. DUVEL. Do you want me to take up all the items together?

The CHAIRMAN. Use your judgment about that.

Dr. DUVEL. I do not think it necessary for the committee to go into the grades already established, as to the number of grades of corn and why we fixed those grades at six instead of four, although I would be glad to go into that.

Mr. HAWLEY. I would suggest, for the information of the committee, that we put into the record a statement such as you have just spoken of, setting forth the reasons for establishing the different grades of corn. I think that all ought to go into the record.

Dr. DUVEL. All right, sir; I can do that.

(The statement referred to follows):

Statement outlining the factors entering into the establishment of grades of corn promulgated by the Department of Agriculture.

In fixing the grades for corn, the grades formerly in use in most of the markets were followed as nearly as practicable, but some of the more important factors which determine the value of any given lot of corn were made a little more definite and specific so that they could be more clearly interpreted by persons not regularly engaged in the inspection of grain. These grades were fixed after a careful investigation embracing approximately 200,000 determinations representing corn from the time it is ready to harvest by the producer until it reaches the consumer, both in this country and abroad. The essential features are definite percentages of moisture content, damaged kernels, dirt and foreign material, cracked corn, and requirements of color. Six grades each were fixed for white, yellow, and mixed corn, these grades running from No. 1 to No. 6, in lieu of the four grades running from 1 to 4, as formerly used, so that under the Federal corn grades there are a total of 18 as compared with a total of 12 previously in use, exclusive of corn of such poor quality as to throw it into a grade of sample rejected or unmerchantable. The principal reason for making six grades instead of four for each class of corn was to properly take care of the wide range in moisture content. The average moisture content of corn as delivered at country elevators during the months from November to March, inclusive, ranges from 19 to 20 per cent, depending on the season; while the average moisture content of corn from June to October is usually below 14 per cent. The corn at this season of the year is generally thoroughly seasoned and cured, and for that reason 14 per cent was fixed as a maximum for No. 1 corn. Under the grades formerly in use this maximum was 15 per cent, and investigations of the department showed this to be too high, in that the moisture content drops rapidly from about an average of 19 per cent in March to 14 per cent or lower in June.

For a similar reason the maximum moisture content for No. 2 corn was fixed at 15.5 per cent in that during the season of the year when any appreciable quantity of corn reaching the terminal markets is graded a No. 2 they can meet a 15.5 per cent moisture content practically as easily as one at 16 per cent, the latter being the limit formerly in use in markets where they had a moisture limit, except in the State of Minnesota, where the limit was 15.5—the same as in the new Government grades.

Under the old system of grading the limit for No. 3 corn was 19 per cent, except that Chicago had 19.25 per cent. A range in moisture from 16 to 19 per cent represents a difference in intrinsic value between the top and the bottom of the grade of 2.7 cents per bushel at the present price of corn of that quality, which is about 72 or 73 cents. This difference was considered too great, so that the limit was extended to 19.5 per cent, to include 0.5 per cent of the old No. 4, and this range divided into two grades instead of one, so that the present limit for No. 3 ranges from 15.5 to 17.5 per cent and the No. 4 from 17.5 to 19.5 per cent. The price in any grade is necessarily fixed on the basis of the poorest quality deliverable under such a grade. As a result of the splitting of the old No. 3 grade the Chicago Board of Trade modified its rules relating to corn deliverable on future contracts. Under the old system, No. 3 mixed corn was deliverable on a future contract at a discount of 5 cents per bushel, while under the new system of grades No. 3 corn with a limit in moisture at 17.5 per cent (therefore being of much better quality) is deliverable on future contracts at a discount of 2½ cents per bushel; whereas the present No. 4 is deliverable at a discount of 5 cents per bushel.

The limit of moisture for the old No. 4 was 22, while the limit under the new grades for No. 5 is 21.5 per cent, so that the intrinsic value of the present No. 5 at existing prices is worth approximately one-half cent more per bushel than the old No. 4.

The grade of No. 6 was inserted primarily to take care of high-moisture content corn, the limit being 23 per cent. The limit was extended to 23 per cent in order to reduce the percentage of corn falling into sample grade, so that shippers would have a more definite idea as to the price they should receive for corn of that quality than they could possibly have when it is thrown into sample grade, which includes damaged and inferior corn of all classes, including heat-damaged and mahogany corn. The other factors were very much on the same basis.

From the standpoint of color a uniform limit requiring at least 98 per cent white was fixed for all grades of white corn and at least 98 per cent yellow for all grades of yellow corn. Under grade rules previously in use there was a wide variation in color requirements, ranging from 90 to 99 per cent, the higher grades in most markets requiring a greater purity of color than the lower grades. For example, it was required in some markets that No. 2 yellow corn should be 95 per cent yellow and that No. 1 yellow corn should be 99 per cent yellow, resulting in a difference whereby a farmer might at one time have No. 2 yellow corn on account of the higher moisture content; but this same corn, after becoming thoroughly cured and dried, would fall into a grade of mixed, the latter usually selling at a discount under yellow.

The CHAIRMAN. Take up the next line.

Dr. DUVEL. That is the project dealing with methods of harvesting and handling grain on the farm. Under this project we go into the field and study. In the case of wheat we study methods of shocking and stacking—that is, the quality and grade of wheat resulting from thrashing directly from the shock, and what quality they get when they thrash from the stack. Our investigators have shown, taking as a basis the prices that expert buyers were willing to pay, a difference of 2 cents a bushel for grain properly handled through the stack.

The CHAIRMAN. That is for stacking?

Dr. DUVEL. Yes, sir; grain properly put up in stacks is worth about 2 cents more a bushel than grain thrashed and handled in the field from the shock.

Mr. HELGESEN. Which is the more advantageous to the farmer?

Dr. DUVEL. That depends on the sections. Taking sections where they have a thrashing crew, prepared to handle grain from the field, they can handle it to better advantage from the shock, but in sections where they stack a good deal and do not have these thrashing crews, but depend on cooperative work between the farmers in the community they can thrash more economically out of the stack.

Mr. HELGESEN. You told us there was an advantage of 2 cents in the manner of stacking. Where is it?

Dr. DUVEL. The investigations carried on in the State of Minnesota show that the advantage there is relatively small, because the cost of putting grain into the stacks about equals the increased profit due to improved quality of the grain—that is, when everything is figured on actual value. Another factor, to be taken into consideration there, is that if the farmer is stacking his own grain he is working to better advantage than when following a thrashing crew.

Mr. HELGESEN. Do you think that is a proper matter for investigation by your department? Now, for instance, in the great wheat sections of the Northwest one of the reasons they do not stack is that they do not have the help to do it. The best methods that can be devised and which you might promulgate would not change that.

Dr. DUVEL. That is largely true in the Northwest, but there are ections where that is not the case. Take Nebraska, for instance. hey usually stack, as a rule, 50 or 60 per cent of the grain.

Mr. HELGESEN. They did that before they had any advice from e Agriculture Department, and they did it because they knew at was the proper method.

Dr. DUVEL. I think there is a tendency to go back to thrashing om the stack.

Mr. HELGESEN. My idea is this: If there is a practical problem at the farmers have settled for themselves before you took it up. hy waste money on that? I do not believe you can tell them anyning about shocking and stacking. They believe it is a good thing, nd they will do it provided they can stand the expense. As long s they know that, why go into that proposition? It is a practical atter instead of a theoretical one.

Mr. STEELE. I do not believe that you can go out and spend illions of dollars on a proposition like that and benefit the farmers. have been up against the game for years. I leave my grain lying n the ground. A rain may come along and I know that it will be uined, but I can not get it up. You may go out and experiment and ell me I ought to shock the grain, but I can not do it. Then, there re times that come along when I want to thrash out the shock. I ave the promise of a machine and the thrashing men, and he romises to come to-morrow, but he gets a little better job with nother fellow and goes there instead of coming over to me, and in rder to get the assistance of a neighbor I have to go there and work ith him and his neighbors for four, five, or six days. In the meanime rainy weather may set in and my wheat start growing. Everyne knows that instead of waiting for the machine that I should stack ny grain. Those are our practical problems.

Mr. HEFLIN. If they will not see the light, if they will not take our advice, you can not force them to.

Mr. HELGESEN. It is not a question of light. It is a question of hether you can get help at the proper time.

Dr. DUVEL. I might add in this connection that we have had a good any inquiries as to what is the best method to follow in order to et the best quality of grain. Now, the only means we have for etermining whether the investigation is desirable are the inquiries e receive from the people; and in order to give the information ught we have to make some sort of an investigation. The farmers, agree, have realized that they are governed by weather conditions, ut I think it is not a waste of money or effort at all when we carry 1 investigations as to the commercial differences in value between acked grain, properly put up under improved conditions, and grain rashed from the shock.

Mr. STEELE. My father knew that 50 years ago.

Dr. DUVEL. Then, he lost the opportunity of making it known to e public.

Mr. STEELE. They all knew about it.

Mr. HAUGEN. What discrimination is made against grain thrashed om shocks?

Dr. DUVEL. It affects the price in the market.

Mr. STEELE. The price for the farmer?

Dr. DUVEL. A great many times it will cause the grain to fall i a lower grade.

Mr. STEELE. To what extent?

Dr. DUVEL. That is difficult to answer, because so much of grain is not bought or graded according to its merits. Many dea have not been educated to the point of insisting on discrimina between grades.

Mr. STEELE. Is it not a fact that the farmer who stacks his g is in exactly the same class as the man who thrashes out of the sh

Dr. DUVEL. Yes, sir; that is usually true; but if the farmer kn he has a better grain that some one else, then he is in a positio demand a better price.

Mr. STEELE. They do not do that at the elevator, do they?

Dr. DUVEL. That is because of the general system of grading w they have. They buy simply as wheat. If you sell a good qua you are selling yours at a discount of one or two cents to enabl elevator manager to pay the same price for your neighbor's wheat. The time is not far distant when good farmers will re to accept such treatment.

Mr. HAUGEN. You mean, if the farmer knew that his grain w better grain than that generally sold in his community he wou in a position to demand a better price?

Dr. DUVEL. Yes, sir.

Mr. STEELE. But if he did not call attention to it, they would call his attention to it and pay him more?

Dr. DUVEL. Yes; but if they buy by grades and the farmer acquainted with the grades, that condition would not exist.

Mr. HELGESEN. The whole thing is based on cost. It is an econ question. Every farmer knows, if they could stack and use own help, they could probably turn out the wheat cheaper, but can not get the help. We have already experienced where the fa is willing to pay three or four dollars a day for his help, an farmer can not get it at any price. I do not believe that you hav us anything now that the farmers do not know. We can not do unless we have labor. Every farmer knows that if his wheat be stacked in the right kind of way it would be better, and all people who can stack are doing it to-day and have been doi since I was a boy. People who can not do it have to make the of it. I do not believe in spending money on giving them infe tion they already have.

Dr. DUVEL. That is simply one of many of the investigatio have taken up; we have inquiries for information as to various factors that affect the difference in value.

Mr. HAUGEN. It has been suggested that we take up these t in the order in which they occur in this list of projects.

Mr. STEELE. For myself, I will say, if you bring in several d ent projects there and group them on us, we have to pick ou things that we know about. This bugology, I do not know any about; but I think when it comes to the grain business, I do. is why I am earnest about my contention that you are spe some money you need not spend.

Mr. HELGESEN. Is it not a fact that the small-scale farmer s and the larger one does not, and that that is the only practical in which they could do that?

r. DUVEL. It goes by sections, as a rule. In some sections they
practically all the grain.
. HELGESEN. Can you point to any farmer with 2,000 acres, or
1,000 acres, who——
. DUVEL. That is the large farm. They would thrash mostly
f the shock.
. HELGESEN. Well, take a man with 480 acres?
. DUVEL. They thrash mostly out of the shock.
. HELGESEN. They do not thrash out of the shock because they
t know that stacking is the best thing, but it is the only way in
they can handle the grain.
. DUVEL. In this same project we also study other phases in con-
on with the handling of corn, the storage of corn, and the differ-
pes of cribs for keeping that corn. There are a great many sec-
in the corn States where the corn is left out in the fields with-
ny protection. The farmers know that is not a good procedure,
hey continue to do that and lose a great deal of corn from
ioration and other causes.
. STEELE. I raise about 450 acres of corn every year. I have
s few corncribs as possible on my farm. I throw the corn on the
d and feed it. It is more economical for me to do that. I leave
ne until January; it freezes up and then I shell it and take it
e elevator. If you can demonstrate to me how I can erect
h corncribs to put 28,000 bushels of corn in, and then by the
f March, when there is practically no corn in the cribs, if you
emonstrate to me how to keep the corncribs from blowing over,
uld like to know that.
. DUVEL. That is a question of engineering. Now, under our
grades, for instance, corn handled in that way usually gets to
arket in such poor condition that there is a difference in value
or 6 cents between standard No. 2 corn and the corn handled
such methods.
. HELGESEN. Is there such a thing on the market, practically,
. 2 corn?
. DUVEL. Yes, sir.
. WILSON. Where is it?
DUVEL. Chicago and many other markets.
. WILSON. We had an estimate before us last year, and it was
there was no such thing except a small amount carried in
go, some of which had to be carried really for the purpose of
ying some men who refused to settle on the basis of the differ-
n price in the grades then established. They said there was no
except in a very small portion of the country, in the South.
. STEELE. Now, you know, there are a great many farmers who
rom owners who do not furnish cribs. The renter in that case
throw the corn on the ground. Are you going to tell that man
ust build corncribs? There are many and many such renters
er our country.
DUVEL. There is some one bringing that question up every day.
. STEELE. Well, if a man is a practical farmer, living on the
and has children enough to do the work, don't you suppose he
ng to take care of his grain and be a good husbandman and
at sort of thing without the United States telling him what
?

Dr. DUVEL. The only thing we can do is to judge by the past. H has not done it, and for the reason, as you brought out a mome ago, that in the majority of sections he sells corn merely as corn. man who shells his corn after the snow has fallen on it and it h frozen up sells 25 or 30 per cent of water. He takes it down a gets the same price as his neighbor, who is selling corn with 15 16 per cent of water in it.

Mr. STEELE. Here is the point: What you are trying to do have the corn graded. Now, you are going to take the farmer wi cornerib, etc., and you are going to grade his corn so as to get h a good price; and these poor renters, who have to throw their corn the ground, you will fix it so that they will not have a show. I perfectly willing to spend money on anything the Department Agriculture can suggest which will benefit the farmers, but I obj to going into matters I believe the farmer has got information This matter is something over which he has no control.

Dr. DUVEL. I will take as an illustration a farmer whom we w experimenting with last summer. He thrashed his grain from field. It contained over 17 per cent of moisture. One of my sistants was doing some cooperative work with him. He said, "W would you do with this?" My assistant said, "Sell it as soon as can; haul it to the elevator; it will not keep." He said, "I can han that. I will have my men shovel it and keep it in condition." T was his view about it. In two weeks his grain was ruined. It become moldy and musty owing to excessive moisture.

Mr. HAUGEN. I know; but it has come to be quite a common th to reflect on the intelligence of the farmer. Congress and the partments have set themselves up as educators of the farmer. I not safe to leave it to the farmer to determine whether he shall bu his cornerib north and south or east and west and how to har and store his crops? That is a question of very great importa Can there be such gross ignorance among the farmers? It does exist in the sections with which I am familiar. Is it necessary Congress to appropriate a large sum of money to send people fr Washington to investigate this matter in order to tell the far how to shuck or stack grain or how to build his cornerib—whet north and south or east and west?

Mr. LEE. Don't you think it would be a good idea to gather t information for the other sections?

Mr. HAUGEN. Well, if such gross ignorance exists in other s tions I will consent to the appropriation. [Laughter.]

Dr. DUVEL. We have made some investigations with reference the width of cornerib, and have made several suggestions look to an improvement in that respect.

Mr. STEELE. Have you discovered anything about ventilators?

Dr. DUVEL. Yes, sir; we have gone into that phase of it.

Mr. STEELE. Does not the farmer know about that?

Dr. DUVEL. It may seem so to you, in your section, where they that kind of thing, but it is not a common practice in all pla We find that considerably more than half of the large cribs are handled in that way. In fact, they are the exception rather t the rule.

Mr. STEELE. I remember 25 years ago I raised a good deal of corn, d I had a carpenter go about and put in these ventilators. The ricultural Department didn't tell me to do that.

Mr. LEE. You said something about corn awhile ago when it was . It has been charged by some people that pellagra is spread by son of using meal made from corn which has begun to decay m moisture.

Dr. DUVEL. I think that theory was held some years ago by some stigators, but I think the general consensus of opinion is that llagra is more a question of diet.

Mr. LEE. Can not we get along with the next item?

Mr. STEELE. We are on the corn-farmer question now, and you tton fellows down there have been taking a great deal of the ne.

Mr. LEE. Did you have any more questions, Mr. Steele. If so, e will be glad to hear from you.

Dr. DUVEL. Then we have the question of the handling and grad- g of grain at country elevators. In that connection we study thods of handling and storing, the mixing of grain from different rms, the amount of cleaning done at country elevators, the quality grain that is delivered by the farmers, and other similar problems.

Mr. HAUGEN. Doctor, we understood you to say you were allotting 0,495 for this project—"the effect on grade and commercial value f farm methods of harvesting and handling grains." Is that mount to be expended for that investigation?

Dr. DUVEL. That is the proposed expenditure for this year.

Mr. HAUGEN. Exclusively for that work?

Dr. DUVEL. Yes, sir.

Dr. TAYLOR. The object of the general study brings that out. It ill be found on page 136:

To show how different methods of harvesting, handling, and storing on the rm affect the commercial grade and value of the grain when sold, with a ew to pointing out to producers how present methods can be improved.

I want to say that this does not reflect upon the intelligence of ie farmers. It reflects upon the intelligence of all of us, that we o not know more in regard to the actual fundamentals involved i the handling of these common products of agriculture. When e have ideas, when we have views, we theorize, and we express iose theories, but when we come right down to the fundamentals e do not know about them. This project was formulated in an ideavor to get at the exact facts with reference to some of those atures.

Mr. HELGESEN. The easiest way to find that out, if it is a serious iestion, is to send out to the farmers and they will tell you the iswers to that. They will tell you that practically.

Mr. HAUGEN. I had no reference to anything said at this time, it I think we will all agree that it is becoming quite common in ongress to reflect on the intelligence of the farmer. They are eated as a lot of ignoramuses. I think we had better call a halt i that. I think upon investigation it will be found that generally rmers are intelligent.

Dr. TAYLOR. In connection with this project that is one of the st things we do—get in touch with the best farmers and find out

how they use that information—along with special investigations so as to give it to those who do not know how to handle it.

The ultimate goal of this group of studies is to develop the most satisfactory methods for the handling, transportation, and grading of grain, and if we are to succeed we must secure a wealth of accurate information regarding the influence of the different methods and processes that obtain from the farm to the mill.

This is perhaps more obvious in connection with the establishment of standard grades for grain, for only through intimate knowledge of the possibilities and requirements of all of the parties interested can grades be established that are fair alike to the farmer, the shipper, and the miller. Specialists in each phase of commercial production and utilization of grain have such training that frequently our men may learn from them much that is important in our work. It is not possible, however, for us to take the opinions of these specialists for facts and rely on them exclusively; we must have figures, based on thorough investigations, the accuracy of which figures can not be questioned.

Dr. DUVEL. We have a great many immigrants who do not know how to handle these matters. They come to us with questions, and we must give them information. In addition to the information which we have already acquired, we get all the information we can from the farmers who know of these things. We go to study their conditions.

Mr. HAUGEN. My observation is that some of the immigrants know more than we do.

Mr. STEELE. A progressive farmer is always trying to give his information to his neighbors and renters.

Mr. HAUGEN. As a matter of fact, the farmer looks at this from a practical standpoint, the department from a scientific point of view. The farmer must take into consideration questions of economy. The farmer is not backed up by Uncle Sam with a $20,000,00 appropriation. He has to get along the best he can. It is necessary for the farmers to practice economy and do the best they can, hence all farmers can not carry out suggestions made by the department although they may be very excellent. I do not want to reflect upon the excellent work done by the department, but to many of us who have had experience these things do not appeal. If necessary, I have a right to criticize your suggestions, but in doing so I in no way wish to have it understood that I discredit the splendid work done by the department. I appreciate that the Department of Agriculture has, according to my views, the greatest body of scientists in the the world; but nevertheless sometimes it may be necessary to check you up.

Mr. STEELE. I will indorse that speech Mr. Haugen has made.

The CHAIRMAN. Doctor, have you completed that project?

Dr. DUVEL. I do not know that there is anything more to discuss on that.

Mr. WILSON. How long has that project been going on; or has it just been proposed now?

Dr. DUVEL. In all these various projects the investigations must dovetail together. In other words, we try to follow this grain from the farm into the country elevator and from there through the var

ges into the hands of the consumers, and find out how it can
dled with the most profit to the producer, without loss or
ration during storage or shipment. That, in brief, is the sub-
f the whole thing.
HAUGEN. Can you give us the result of the investigation?
CHAIRMAN. This was begun in 1907?
DUVEL. Yes, sir.
HAUGEN. Was not some of this work done by Dr. Wiley, the
t—the handling of grains, etc.?
DUVEL. No, sir; that was carried on in our office, starting in

WILSON. What have you found out about the handling of
t the country elevators?
DUVEL. The investigations have resulted in much larger quan-
f grain being bought on the basis of grade. We have also
ated with a great many country elevators and find that it is
y practicable for them to buy and handle on the basis of
. They are doing it now in many sections to the entire satis-
of the producers in the communities in which they are located,
ually to the satisfaction of the elevator men.
WILSON. Do you find that mixing is indulged in to any extent
country elevators with a view of meeting the grades, as it is
n the terminal elevators; for instance, taking high No. 1 and
it with No. 3 to make No. 2?
DUVEL. Yes, sir; they do that. If they have high No. 1 they
ix it with the lower grade to comply with the requirements of
grade.
WILSON. To what extent did you find the farmers' elevators
cilities for doing that?
DUVEL. They have all the facilities. It can be done if the bin
s available.
STEELE. In the case of a car containing two different grades,
s the price?
DUVEL. It all comes in together, and the price the shipper re-
is based usually on the poorest grade of grain he has in the
e price paid by the consumers is based on that price.
WILSON. Do you find, under the grading rules now in force,
is generally true that the grade is based on the poorest grain
car?
DUVEL. Not entirely so. It depends on the condition of the
in the car. If the car bears evidence of having been plugged,
usually the case.
WILSON. Do you buy grain in the country?
DUVEL. No, sir; but I know something of the practices.
WILSON. You know Jones can not pay any more for his wheat
mith; is not that the fact?
DUVEL. No, sir.
WILSON. And when you go along that is practically the cus-
ith all grain elevators. Say the price is 81; every farmer who
is grain that day gets 81. If he would pay 82 to one par-
fellow, that whole bunch of fellows who sold for 81 would
his back demanding 82.
HELGESEN. You want to qualify that—81 for a particular

Mr. STEELE. Everyone in the neighborhood will claim his grai is as good as Smith's.

Mr. HELGESEN. On this thing I am interested. You say "han dling of grain in country elevators." I have looked over the thi and I do not believe there is anything you can tell those count buyers, in a practical way, because no one can be a wheat buy unless he has had experience in the elevator. He is supposed to l an expert man. He is practically as much of an expert as you experts are. In that case, do you believe you could teach the anything?

Dr. DUVEL. That matter does not come under our investigation.

Mr. HELGESEN. Well, I do not know how you can do anythin except in the handling of grain in terminal elevators. That is som thing you can take up. The farmer does not know about that. I imagines he knows. There is a great deal of complaint and a gre deal of dissatisfaction. I believe, if you should go into the termin elevators and find out the actual conditions and give the facts t the farmer so he can satisfy himself that it is handled satisfactori and that he is getting a fair proposition, I believe you would l rendering him a good service. But when you come to the count elevator, I do not know that you can do anything there.

Dr. DUVEL. Less than two months ago I had a letter from a late appointed superintendent of an elevator. He said, "I wish y would send some information to me to enable me to distinguish b tween the different varieties of wheat and to grade wheat, barl and oats."

Mr. HELGESEN. Oh, you will find incompetent men in all lines.

Mr. WILSON. You do not give him information as to how to l come a good grain grader, do you?

Mr. HAUGEN. Did you give him information as to how to ov come that?

Dr. DUVEL. That is an exception, but I just pointed it out show that they are not all expert grain buyers or grain men, b cause they are not always familiar with the situation.

Mr. HAUGEN. Well, it is not the purpose of the department make expert men of them.

Mr. HELGESEN. Whenever you find a situation like that, you w agree he will not be a grain dealer very long?

The CHAIRMAN. I think we had better defer further considerati of Dr. Duvel's work until Monday. The committee will therefo recess until Monday morning at 10 o'clock, at which time Dr. Du will resume his statement.

(Thereupon, at 5.30 o'clock p. m., a recess was taken until Mond January 24, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Monday, January 24, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. When the committee recessed on Friday evening, we were still considering item 83, page 61, of the Book of Estimates, and Dr. Duvel was discussing the item in the program book on page 37, "Handling and grading grain at country elevators."

I wish, Dr. Duvel, you would briefly summarize that item for us.

STATEMENT OF DR. J. W. T. DUVEL, TECHNOLOGIST IN CHARGE OF GRAIN STANDARDIZATION, BUREAU OF PLANT INDUSTRY—Continued.

Dr. DUVEL. This is the work that is carried on incident to the fixing of standards, with the idea of finding out the quality of grain from the farmer's standpoint and the conditions they have to contend with; that is, adverse weather conditions, shortage of suitable labor, etc. We want to find out the moisture content of the grain delivered at a country elevator that will store and keep safely, the quantity of dirt in the grain, and all similar factors, so that when it comes to fixing the grades the farmer will be thoroughly represented and that the grades and standards so fixed will be such as he can deliver and which will not be a detriment to him and not put him out of business in any way. For example, in testing the moisture content, we want to known what percentage of the various grain crops will come within the various limits of moisture content, and so on, so that the producer can meet a grade without any hardship. We do not want to throw the bulk of his grain into sample grade; but, of course, sample grain can not be fixed so low that all the grain coming in will be No. 1, because, if it was, then the price would be likewise fixed on a lower basis.

Mr. HELGESEN. Speaking about the question of dirt and moisture content, according to your system of inspection, would you take the dirt into consideration in grading it?

Dr. DUVEL. At the present time some markets grade down on account of dirt, while others have a dockage system. Our idea has been to leave that largely to the trade and to the farmers themselves. Either system is equally just, so far as that is concerned. It matters not whether you grade down and pay a little lower price as a result of the lower grade for the grain, or whether you deduct a certain amount from the weight as dockage. It comes out at the same point in the end.

Mr. HELGESEN. As a matter of fact, the farmer is more interes in the way the grade is applied than he is in the grade itself: is that true?

Dr. DUVEL. Yes, sir.

The CHAIRMAN. As I understand this item, for which you using an appropriation of $7,875, it is really for the purpose of abling you or helping you to fix your standards?

Dr. DUVEL. Yes, sir. Take all of these items where investigati work is carried on; it is in order to get fundamental and sound so that we can fix standards that will be equally just to the prod the dealer, and the consumer.

The CHAIRMAN. This is an incident to the standardization w

Dr. DUVEL. Yes, sir.

The CHAIRMAN. As a matter of fact, you are doing practi no work in going out and telling the farmer that it is better for to keep his grain dry than it is to have it wet, or that it is b for him to shock his grain than it is not to shock his grain. Is true or not?

Dr. DUVEL. That is true. We study these conditions as they under good farm conditions.

The CHAIRMAN. And that is purely an incident to the other work?

Dr. DUVEL. Yes.

The CHAIRMAN. I wonder how much you have spent on the m of ascertaining whether it is better to thrash from the shoc from the stack in the course of seven or eight years?

Dr. DUVEL. The question of thrashing from the shock or the stack is purely incidental, and I believe all told we hav spent over $2,000 on that—surely not over $2,500.

The CHAIRMAN. In how many years?

Dr. DUVEL. Since 1907; since the work was begun.

The CHAIRMAN. Your work in that case has been practi limited?

Dr. DUVEL. Yes, sir; purely to acquire data about the fixi standards.

The CHAIRMAN. I am glad you made that statement, beca think there is some confusion on that proposition.

Mr. HELGESEN. On the question of the moisture content, don' think a strictly hard wheat can carry more moisture safely t soft wheat?

Dr. DUVEL. Yes, sir; it will.

Mr. HELGESEN. Then you could not have the same standa moisture content for all sections of the country?

Dr. DUVEL. Oh, no; not the same standard for all wheats. would have to be one standard for hard spring wheat and anoth hard winter wheat and another for soft winter, and also an standard for durum wheat; that is, in these standards it is no idea to have the same grade requirement apply to a spring wheat the other wheats. Spring wheat from the northwestern sectio carry more moisture than the other wheats.

The CHAIRMAN. Take up your next item, handling and gr grain in terminal market

DUVEL. There we study, in cooperation with the grain trade, nsportation companies, and the elevator companies, the qual- the grain received, the question of mixing in the elevators, hy they mix, the quality of the different grades, and other s relating to the handling, storing, and grading of grain in al markets, these matters all being incident to the question of the standards.

CHAIRMAN. Are there any questions on that?

HELGESEN. Would it not be a very good thing if you could ither a bulletin or put it into the hearings here as to what ink is necessary to be considered in the establishing of the —all the things that have to be taken into consideration— ve a general plan of what you propose to do in case you grade?

DUVEL. I can cover that in just a statement or two. Our idea ollow, as closely as possible, the various factors that have been in the trade for a number of years and to accept many of those s that the trade now requires. For instance, we have moisture it; a great many of the markets specify that the grain shall or reasonably dry, which means nothing when you come to down, because no two persons have the same idea of dryness plied to grain. They also provide that it shall be clean or ably clean. We believe it can be made definite as to what e considered as clean or reasonably clean, and that such factors fixed on a definite percentage basis, not with the idea that it e necessary to make all of these determinations in every case, ther to provide something definite by which to measure in case spute as to grade.

HELGESEN. Suppose a grain does not come up to your standard ng "reasonably" clean, what would you do with it?

DUVEL. Under our standards, as we have in our corn grades, ow 1 per cent dirt in No. 1 and No. 2, 2 per cent in grades and No. 4, and as you go down the line we allow a little more.

HELGESEN. That would absolutely kill the wheat industry.

DUVEL. That is under a dockage system. It can be handled, rse, on the dockage system.

HELGESEN. Whether it is handled by dockage or price, it does tter. If you had No. 1 hard wheat, or No. 1 winter wheat, or ver it may be, and it has a certain amount of screenings or dirt that does not change the value of the wheat one particle. It ought to be docked enough for the amount of dirt in it, and eaves it as good as perfectly clean wheat. If you say that wheat can not carry more than a certain percentage of dirt, ou do this, it would make it under your system a No. 2, which ically wrong.

DUVEL. This would not happen if it were graded on the dock- stem.

HELGESEN. There are two dockage systems; one is the dockage ght, and the other is the dockage in price. But in either case rt does not effect the grade of the wheat.

DUVEL. If you adopt the dockage system, then it matters not wheat carries 1 per cent of dirt or 10 per cent; it would still 1.

HELGESEN. Yes; and I have known them to dock as high as cent sometimes.

Dr. DUVEL. That is a matter to be decided on: it is a matter on which the department has not come to a definite conclusion. Undoubtedly, for spring wheat the dockage system would have to be applied.

Mr. HELGESEN. Under any system which would reduce the grade of the wheat because of the dirt (that is a vital question to us), whether it is reduced on the dockage system or whether it reduces the price, the purchaser knows enough to protect himself—never fear about that—and if he finds dirt in it he is going to do one of two things; he is going to have enough weight docked to cover that, or he is going to pay less money—to allow less. But if you are going to reduce a first class wheat a grade simply because of the dirt, I do not see how the farming industry is going to get along.

Dr. DUVEL. You would not reduce the price under the dockage system; but under the other system the very minute you reduce the price you reduce the grade.

Mr. HELGESEN. Oh, no.

Dr. DUVEL. It is the same thing.

Mr. HELGESEN. Oh, no; you do not do that. Take No. 1 hard wheat, for instance, as an illustration: No. 1 hard wheat is worth we will say, 3 cents more than No. 2, and it carries 10 per cent dirt. Now, if you use the price system, a man would pay 10 per cent less for that wheat than he would for wheat perfectly clean; but if you graded it as No. 2, he would also take off 3 cents for the grade. That is manifestly unfair. It is perfectly all right to take off enough to cover the dirt, but after you do that the grain itself is all right and there is no reason why you should cut the grade.

Dr. DUVEL. I think your last statement is absolutely correct.

Mr. HELGESEN. Consequently, the amount of dirt in a grain ought not to have anything to do with its grade.

Dr. DUVEL. Not if he is going to discount the price; no.

Mr. HELGESEN. But he must do one of two things—either dock the weight or reduce the price because of the dirt, under either system simply to cover the dirt that is mostly screenings, weed seeds and all those things; but that ought never to affect the grade of the wheat.

Dr. DUVAL. It is merely a convenient way in the trade of discounting, to put it into a lower grade.

Mr. HELGESEN. But that is vicious; that is absolutely wrong. I do not see how a man can farm under those conditions. If I raise a No. 1 hard wheat, as good as ever raised on the face of the earth but happen to have a lot of grass seed and various other things in it I am perfectly willing to be docked for the amount of dirt in it, but I object strenuously to having my wheat graded No. 2 because of the dirt that is in it.

Dr. DUVEL. The department would recommend no system that would dock for the dirt that is in it and also cut the wheat a grade. That would be entirely wrong; I agree with you there fully.

Mr. HELGESEN. I know; but I do not think it should ever be taken into consideration, because if you ever allow a grain to be reduced because of the dirt in the grain—and that is exactly what is going to happen—you are going to get the price of the lower grade and then you are going to be docked for the dirt that is in the wheat.

Mr. McLAUGHLIN. Pardon me, but did you not say a moment ago that the customary way to do it, and the way you think is right, is to put it in a lower grade?

Dr. DUVEL. That is what they do in most markets. In the Northwest at the present time all the spring-wheat grading is on the dockage system. They grade according to the quality of the wheat and dock the number of pounds per bushel for the amount of weed seeds and screenings and the dirt that is in it.

Mr. McLAUGHLIN. You mean by docking that you grade it high enough but dock in the price; is that it?

Dr. DUVEL. Under the dockage system what happens is a dockage in the weight; that is, by means of sieves they determine the number of pounds per bushel of weed seeds, dirt, etc., and deduct this from the weight. For example, in the Minneapolis market if the dockage was found to be 2 pounds, they deduct 2 pounds from the bushel. In other words, the farmer delivers 62 pounds and gets paid for 60.

Mr. STEELE. That is the proper way to do it, is it not?

Mr. HELGESEN. That is perfectly all right. But suppose you say a certain grade of wheat can not carry over 2 pounds or 3 pounds or 5 pounds—it does not make any difference what—and if it does carry more than that it will be reduced in grade. That would be absolutely wrong and absolutely unfair. It has not been done heretofore and never will be done under a practicable system.

Dr. DUVEL. It is not done in the Northwest; no, sir. I think the dockage system is better in the Northwest; but in the other markets they work on the other basis. The grain is graded, we will say No. 1, and we will say wheat is worth $1.20 a bushel or 2 cents a pound. Now, if it has two pounds of dirt in it, in the Chicago market they will put it down into a lower grade on account of dirt. Two pounds of dirt is 4 cents in terms of wheat. Now, say No. 3 wheat is worth 4 cents under No. 2. It does not make a particle of difference whether it is thrown into a No. 3 grade, which brings 4 cents under No. 2 or whether you tell a man you are going to deduct 4 cents from the price, or whether he has to deliver 62 pounds per bushel, because you are at the same place when you get through.

Mr. HELGESEN. Oh, you will not. You are absolutely wrong about that. Here is wheat worth $1.40 a bushel. I am more familiar with wheat than I am with corn. With No. 1 hard wheat, say there was two pounds of dockage. Under a proper system that would dock 4 cents for dirt, but they will pay the price of No. 1 hard wheat.

Dr. DUVEL. Certainly.

Mr. HELGESEN. But the minute you make it No. 2 (and No. 2 is worth 4 cents less than No. 1, we will say), then they deduct 4 cents for grade and 4 cents for the dirt.

Dr. DUVEL. Mr. Helgesen, you do not understand me on this thing. There are the two systems: You have to take either one or the other. Where you have a dockage system, of course, the grade does not change because of dirt. Then you grade according to the quality of the wheat you have and simply are docked for the dirt.

Mr. HELGESEN. I understand you perfectly, but I think you get mixed on the two propositions, because whether you dock so many pounds for the dirt or whether you take off so many cents for dirt, it is all dockage. That has to do with the dirt, but it ought not to have anything to do with the grade. Now, suppose you reduced the grain

one grade, and that grain carries so many pounds of dirt, and it goes under a system where they do not dock as they do in the Northwest, by weight, but they dock by price. You have reduced it a grade, and when the purchaser buys it he buys it at the price of No. 2, and then he simply takes off another so many cents for the dirt.

Dr. DUVEL. No: these two systems can not be used at the same time.

Mr. HELGESEN. He has got to, for this reason: Your wheat sometimes is graded down for other reasons than dirt. The grade of the wheat is No. 2, irrespective of the dirt, and then you have to deal with the dirt problem besides. If there was only one thing considered and that was the dirt, then your system would be all right. But there are other reasons for your grading the wheat down below No. 1.

Dr. DUVEL. Certainly.

Mr. HELGESEN. Now, when you strike a lower grade, No. 2, say, it may be for dirt and may be for something else; but there is a certificate, and the fellow says it is No. 2 wheat, because your certificate says so. Why is that? I don't know. But I know there is a lot of dirt in it, and therefore I will take off that much more for dirt. There is no difference in principle, after all, for dockage whether you dock by weight or dock by price.

Mr. OVERMYER. But they do not do both at the same time.

Dr. DUVEL. No. It is either one system or the other; both systems are never applied at the same time.

Mr. HELGESEN. You are getting mixed up now. They do this in the Northwest. We dock for the actual dirt that is in it, so many pounds of dirt that is in the grain, but that has nothing to do with the grade at all. It might be the finest wheat that was ever made, and it may have 10 per cent of dirt in it. If it does, you take off 10 per cent in pounds, not in the price, representing the actual dirt in it, but for the wheat you have that is clean you get the highest price that would be paid for similar grain if it was clean. And that is the only proper way to do it.

Now, dockage by price is identically the same as dockage by weight, except you take off so many cents a bushel, representing the dirt that is in the grain. But I claim it ought to have nothing whatever to do with the grade of the grain.

The CHAIRMAN. Have you finally settled in your own mind just which one of these systems you would apply in the standards you fix?

Dr. DUVEL. We would prefer to leave that question until our investigations are more complete.

The CHAIRMAN. I take it you take into consideration the very idea Mr. Helgesen is expressing. I think I see his point of view very fully myself.

Mr. HELGESEN. I am not interested in knowing which of these systems they are going to adopt. That is another matter. But I am interested in knowing whether or not he has made up his mind that the amount of dirt in grain is to affect its grade. That is a very vital thing to us in the Northwest, and I think it is one of the things that ought to be very easily settled.

Dr. DUVEL. You have to take care of it in some way.

Mr. HELGESEN. You take care of it by dockage and not by grading.

Dr. DUVEL. The Government can in no way, as I see it, establish a discount in price that the elevator men must pay on account of the dirt. It can not fix the price.

HELGESEN. You simply do this: You say that the grain con- many per cent of dirt. Then that ends it. Now, as a buyer, g how much dirt there is in it, I will take care of myself. If ins 10 per cent of dirt the farmer gets 10 per cent less than l not contain the dirt. That is a matter of buying and selling. ur business is to determine the amount of dirt that is in it. ving reached that far your responsibility ends. The rest is r of commerce between buyer and seller, which he takes care elf.

McLAUGHLIN. You would issue a certificate to the effect that eat is No. 1.

HELGESEN. And contains so many per cent of dirt. That is as he grading can possibly go.

McLAUGHLIN. So when the prospective purchaser comes in ith it he will know it is first-class No. 1.

HELGESEN. Yes; and he will also know——

McLAUGHLIN. That such reduction as has been made has been n account of the dirt.

HELGESEN. There has not been any reduction made.

McLAUGHLIN. A moment or two ago you spoke as if the pros purchaser might not know why it was reduced.

HELGESEN. He can not if you cut it a grade.

McLAUGHLIN. Could not a certificate be issued that the wheat t put into grade No. 2 because of the dirt?

ANDERSON. But it would not be because of the dirt.

McLAUGHLIN. Mr. Helgesen was saying the purchaser would ow whether it was or not.

HELGESEN. He might not know, unless he had a separate cer- and that would be absolutely unbusinesslike and an unneces- rtificate. I believe by all means he should have a certificate nting the actual value as a clean grain. It also ought to state uch dirt there is in it. When you have done that the ibilty of the Federal Government or the State government, ver one grades it, or any private grader, ends, because when ve a certain grade of grain and you know there is a certain of dirt in it the rest becomes a commercial proposition that t concern the Government at all.

McLAUGHLIN. That is, you would have a certificate issued would certify that it has this amount of dirt in it and that it g to a certain extent.

HELGESEN. Not at all.

OVERMYER. The wheat would be first-class wheat if the dirt of it.

ANDERSON. The wheat is just as good, the grain is just as good, ie dirt in it as if it was out of it. The only reason for it is that the man who buys the wheat would buy it at a it discount to take care of the amount of dirt in it. That is atter of grade at all.

OVERMYER. The wheat grade is all right. With the dirt out . 1 wheat.

HELGESEN. But the question now come up under the present as to whether or not an inspection system has deducted too , and sometimes the farmer is not satisfied with the results. e wants a system in which he has absolute confidence, and he

wants that system to represent exactly the value of the grain as if it was clean, and he also wants to be told how much the dockage is for the dirt, either in price or in weight. It does not make a bit of difference. Having received that certificate he goes to the market and sells that grain to the purchaser, and they have notice that it is No. 1 wheat, but should be docked 2 pounds on account of dirt, and that satisfies both the seller and the buyer. But the price paid for it on account of the grade itself never ought to be taken into consideration at all.

Mr. HAUGEN. What progress has been made by the department in establishing grades for wheat?

Dr. DUVEL. We are in this position: We have hard winter wheats and soft winter wheats pretty well lined up now. There are certain sections where we ought to do more work, especially in the spring-wheat section, so as to know the quality the producers can deliver under good average conditions, and we ought to do a little more work on the Pacific coast and also in some of our Southern States. There has been practically nothing done in the study of the wheat in the Southern States. Of course, the production is limited, yet the matter of grades is just as important to the southern wheat growers as to the northern. We feel that we should go ahead with these investigations and, in the event of the passage of the grain grades bill, we see no reason in the world why we could not, with the data we have as a basis of discussion, get together with the trade and the farmers' organizations and representatives of the consumers and agree on some system of grading and on some standards which could be applied and let the investigation go ahead, with the view of making such modifications later as might be necessary. There are some more points to be covered. In all, we have handled in the neighborhood of some 50,000 samples of wheat, representing wheat in all conditions, but, as already stated, our work has been more with the winter wheats than with the spring wheats.

Mr. HAUGEN. With the many and varied interests, it is not possible that an agreement can be reached between the interested parties, and the purpose of this investigation is for the department to determine as to the grades.

Dr. DUVEL. That is what we want to get. Of course, we want to have the benefit of their experience, the benefit of their views, a discussion which we feel would be desirable, before those grades should be fixed, using the results of our investigations as a basis.

Mr. HAUGEN. How long have you been working on this?

Dr. DUVEL. I think the first appropriation was made in 1907.

Mr. HAUGEN. You have been working on the standardization of wheat ever since?

Dr. DUVEL. Our work has been concentrated more on corn than on wheat, but we have done a great deal on wheat and oats and on rice.

Mr. HAUGEN. But so far you have established the standards on cotton and corn and gotten fairly well along with wheat; is that it? The work has been concentrated on cotton and corn?

Dr. DUVEL. The cotton does not come under this item. This covers just the grains.

Mr. HAUGEN. I am speaking of the department. There was $700,000 appropriated.

DUVEL. Yes, s .
HAUGEN. I ta you have knowledge of both?
DUVEL. Yes, s .
HAUGEN. What have you to say about the statement made by obson the other day? His contention was that three practi- could establish the standards not only on the wheat, but for grains in this country, in six or nine months.
DUVEL. That is to say, three practical men, no doubt, could get r and agree on some grades the grain trade has done, and working basis; that is, for a ular locality. Now, Mr. n understands thoroughly, I , the wheat of the North-

HAUGEN. He said that the standards for the Northwest could l or established in three months, and he said for the whole in——
CHAIRMAN. Seven months.
DUVEL. I think that is too short a time. You can get together, se, and agree on something and call it the standard.
HAUGEN. In determining a standard or ascertaining a fact re than an agreement. I take it he weighed his words when e the statement.
DUVEL. Take the grain inspectors in Minneapolis. Of course e familiar with the grain that comes into their market. So Chicago men familiar with the grain that comes to their But they have very little knowledge of the grain going er markets; they do not have any opportunity to know.
HAUGEN. If grain goes to Chicago, they have a grade in

McLAUGHLIN. Is there such a difference between the grain at polis and Chicago that the grades would not be satisfactory

DUVEL. They have the spring-wheat grades, of course, and ey have soft and hard winter wheat grades. That would be asses; and the durum wheat would make four classes.
HAUGEN. In what respect would the grades differ—take, for , at Buffalo and at Chicago and other terminal cities?
DUVEL. I could not give you that offhand; but they differ in espects. Take, for instance, the dockage systems we were ng. Take it in the Northwest; at Minneapolis and Duluth ve the dockage system; they are the only two markets in the where they have a dockage system. Otherwise it is not that way. In order, for instance, for durum wheat to grade he rule says that it "shall be clean" in one place, and in it says it "shall be well cleaned." The variations are in tle details, and they are indefinite.
HAUGEN. But that is just a question of system; which system going to adopt—whether there is to be a dockage system or r.
DUVEL. Of course, aside from the question of dockage, in the nt essentials in the question of grades the grade rules in the t markets do not differ a great deal. It is in the interpreta- or instance, a great many of them say that a certain grade t shall be "reasonably dry" or "shall be dry." There are no ple who will agree on what is a dry wheat.

Mr. HAUGEN. The only difference is this, that in some of the terminals they adjust the grade to existing conditions to suit their convenience and their purposes, as was stated here before. At Chicago, for instance, if the operators have a lot of future contracts outstanding, it is found necessary to reduce the quality of the grain to make it possible to apply a grain of less value than the contract calls for the grade is changed.

Dr. DUVEL. Yes, sir.

Mr. HAUGEN. That is in the power of the exchanges. This bill as I understand it, is to take that power away from those exchanges and to leave the fixing of grade in the hands of some disinterested party—the Department of Agriculture.

Dr. DUVEL. So that our grades will be fixed in a way that everybody will understand.

Mr. HAUGEN. And will have a permanent, uniform standard?

Dr. DUVEL. Yes, sir.

Mr. HAUGEN. Now, then, to what extent do the grading systems differ in the various sections of this country?

Dr. DUVEL. Their systems?

Mr. HAUGEN. Yes.

Dr. DUVEL. It is largely a question of interpretation as to the rules; that is, the rules themselves do not differ a great deal.

Mr. HAUGEN. If it is a matter, then, of interpretation, there is no much difference now. I thought you had reference to the rules, not to the interpretation of the rules.

Dr. DUVEL. It is the interpretation of the rules.

Mr. HAUGEN. They have agreed on something definite as to the grades, but change it from time to time?

Mr. HELGESEN. There must be a vast difference in the rules.

Mr. HAUGEN. That is what I am trying to get at.

Mr. HELGESEN. Do I understand you to say that there is any terminal market in this country that grades the grain according to the dirt that is in it?

Dr. DUVEL. They all do, except Minneapolis and Duluth.

Mr. HELGESEN. I will have to refer to the rules before I can believe that, because I think there is a misunderstanding.

Dr. DUVEL. There are one or two additional markets, such as Superior, within the spring-wheat section where they have a dockage system. The other markets grade down.

Mr. HELGESEN. I understand they reduce the price because of the dirt; that I will agree to. But I do not think they reduce the grade of the grain itself because of the dirt that is in it; that is a different proposition. If they do, it is radically wrong; the system itself is wrong if they do.

Mr. HAUGEN. Has the department gotten along far enough to determine what system it will adopt in grading grain?

Dr. DUVEL. No, sir; except I will say this, as I said before the grain trade, that the more we go into the dockage system, the more we study that system, the better we like it, as I expressed to the grain trade at their meeting in Peoria last fall.

Mr. HAUGEN. Mr. Chairman, what I would like to know is what progress has been made by this department. Including appropriations for last year they have expended $707,000, and a member of the Warehouse Commission of Minnesota comes before this com-

and states that definite grades can be established in seven
for the whole country.
HELGESEN. That would be for a small amount.
HAUGEN. All grain—for the whole country. Now, is it not
that we could get some information as to what progress
n made so that we may report to Congress the progress

UVEL. To answer that question perhaps I might read the
ta rule for northern spring wheat. It says: "No. 1 north-
ng wheat shall be sound, sweet, and clean, may consist of
and soft varieties of spring wheat, and weigh not less than
ls to the measured bushel." There is but one definite thing
ule, and that is "shall weigh not less than 57 pounds to
ured bushel." That is one of their old rules (1909), but it
cally the same as at the present time. The present rule in-
e word "dry"; otherwise it is the same.
NDERSON. The present rule requires a certain definite per-
f hard wheat, does it not?
UVEL. No, sir; not in No. 1 northern. Over 50 per cent is
in No. 1 hard spring.
ELGESEN. What grade is that?
UVEL. The rule just read is for No. 1 northern. I do not
these grades here for the different markets. The wording
y different in most of the markets. In substance they are
y the same, and the slight difference makes it impossible
make a fair comparison of them.
NDERSON. You do not imagine you are going to be able to
any mechanical basis which will determine whether grain
or sweet, do you? That is always going to be a matter of
t on the part of the inspector?
UVEL. A lot of those things will have to be left to the judg-
the inspector; yes, sir.
HAIRMAN. Now, let me see if I can not help Mr. Haugen
elf to get a fair understanding as to what we are trying to
I do not think the committee is so anxious as to the process
n you reach your determinations as to the grades, because
ot experts. I am impressed with Mr. Helgesen's idea of
m of docking, yet I would not set my judgment up against
n expert as to the system. Mr. Haugen is trying to find
t progress you have made since 1907 in reaching a deter-
in your mind as to the standards for wheat, oats, millet,
, barley, and such other grains. For corn we know, of
at you have promulgated your grades, and that now leaves
et, sorghum, wheat, barley, oats, and others to adopt stand-
You have been working since 1907 and you have spent a
l of money on that proposition. Mr. Haugen is trying to
how near you are to the end. Isn't that what you are try-
d out, Mr. Haugen? Mr. Haugen wants to know how long
e before you can say you have established a standard for
ow long it will be before you can say you have established
d for oats, and so on. That is what you are driving at?
AUGEN. The question is to show what we have for the
invested.
HAIRMAN. Now, answer that question.

Dr. Duvel. I think in some statements we have submitted we say we would like to have another year's work on wheat and oats before we would fix the standards for those two grains.

The Chairman. Now, that is getting definite.

Dr. Duvel. So far we have done practically nothing. It is on the same grain as corn, of course, as the barley grows. The same kind of rye. We have practically not touched the work except the work at Kansas City.

The Chairman. You answer is that during these years since 1908 and with the money you have had you have reached a place where you can say to us that with one year more work you will be able to have your grades on wheat and oats.

Dr. Duvel. That is the way we feel about it at the present time.

Mr. Haugen. Mr. Chairman, if I remember rightly, that is exactly the statement made heretofore, and it does not answer the question. The question is, what have you accomplished; what has been done; what have you to show for the $707,000?

Mr. Haugen. Out of this appropriation you have made the standards for cotton?

Dr. Duvel. That is under another item.

Mr. Haugen. You made the standards for corn out of this appropriation?

Dr. Duvel. Yes, sir.

Mr. Haugen. I am taking the two appropriations under the one head, $707,000. Now, Mr. Chairman, is it a fact, then, that the department can not report a single thing that has been accomplished; that it has made no progress; that there is not a single thing that can be pointed to that has been accomplished?

The Chairman. I do not think that follows at all. I think Dr. Duvel's answer to my question is in the nature of showing progress.

Mr. Hedges. Mr. Chairman, there has been, as near as I can get from the hearings, $707,000 spent in an attempt to establish grades on agricultural products.

The Chairman. I have not looked up the figures myself.

Mr. Hedges. I do not know what the figures are on it. Would it not be possible for the department to make a statement as to how that money was used; what proportion, approximately, of that amount was used for cotton and what proportion for corn and for the other grains, so as to show how much has been spent in each line?

The Chairman. Could you do that, Dr. Duvel? That would answer your question, would it not, Mr. Haugen?

Mr. Haugen. No; we have that information now in this program book. But what I am trying to get at is, has any progress been made?

The Chairman. What will the department say to that? What progress has been made, Dr. Duvel? Answer that question, please.

Dr. Duvel. We have fixed standards for corn, and with a little more work we can fix the standards for wheat and oats; we are also fairly well along with the rice work. In the event of the passage of the bill to supervise grading, I think we have data enough so that we could get together with the trade and fix such standards now.

Mr. Hedges. Mr. Chairman, on Friday, if I remember rightly, this question of the $700,000 appropriation was before the committee,

ad I believe the statement was then made that only $50,000 had been ent on corn.

Dr. DUVEL. That is on the actual fixing of the grades. Of course, l of the work under these projects furnishes a basis for standards d is carried on mainly with that in view. The $50,000 is only for e actual fixing of the grades on corn.

Mr. HELGESEN. If you could divide that into divisions of corn, tton, wheat, and so on, and show approximately the amount spent r each one, and then state under each one how far you have gotten, w much you have accomplished up to date, with the money spent, at would cover it. You do not need to give it to the stenographer st now, but you can put it into the record.

Dr. DUVEL. That would be almost an impossibility, because the an who is going out to study corn conditions is also, at the same me, collecting samples of wheat and samples of oats. He may go t into the yards and bring in a dozen samples of each kind of grain, r he may bring in a dozen samples of corn and one of wheat.

Mr. HELGESEN. During the time you have spent that $700,000, nen—during the time you have been studying those conditions of arley, wheat, oats, and all that—it was with a view to establishing rades?

Dr. DUVEL. That is, the essential features, of course—the improv- ng of methods of handling, the improving of methods of storing, nd such questions as the effect of bleaching on the value of the ifferent kinds of grain, the carrying qualities of the different kinds of grain, and the keeping qualities in the bins, such as Mr. Jacobson brought out here the other day in connection with some of the work they have been doing in Minnesota with spring wheat. It is factors of that kind which we feel are necessary if we are going to fix grades on a proper basis. Take No. 2 wheat, for instance. No. 2 wheat should be wheat that will carry for a reasonable length of time in storage.

Mr. HELGESEN. Why should not all grades?

Dr. DUVEL. We find, for instance, that about 8 or 10 per cent of grain coming into the market is musty and out of condition when it arrives. I mean when it arrives it should have carrying qualities, and that, of course, is simply a question of grading. Now, it is necessary to find out the causes of these conditions, the amount of grain that comes in in that condition, and what can be done with it, before we can fix a definite grade.

Mr. HELGESEN. For instance, I have sold carloads of grain where I got within half a cent of the price of No. 1 hard, and yet it was a low-grade grain because it was all damp and would not carry; yet the miller would say he could use that right away. But when you come to grading grain, whether it be No. 1, No. 2, No. 3, or No. 4, it must have carrying qualities—that is, not over a certain moisture content; if it does not have carrying qualities, then it must be classed as a low-grade grain and sold by sample.

Dr. DUVEL. That is a low-grade grain, and under all the systems that have been in practice grain of the lower grades is not expected to carry as long as the higher grades. For instance, if a man buys No. 2 for delivery in the East, he knows it is coming to him sound and sweet, or should if properly graded. But if he goes to Chicago and buys No. 4 wheat, as all grades permit No. 4 wheat to be damp,

he is taking the risk that it may be musty and sprouting when reaches him.

Mr. HELGESEN. I do not think that is a fair proposition at all. I buy any grade in any market. I have a right to expect it will graded properly. If it has too much moisture in it, it should not graded at all, but it should be sold by sample and the buyer t the chance.

Dr. DUVEL. That is, of course, a matter of opinion. Unde system of that kind you would throw a very high percentage of grain into sample grade. The corn moving to Chicago now on t basis would be mostly sample grain.

Mr. HELGESEN. I am talking about wheat. I do not know more about corn than the corn man would know about the wh business, but I know it should not be graded wheat unless it carry in a good condition for a certain length of time: it ought not be graded at all, because if it is the purchaser has no protection wh ever. The purchaser knows it is a No. 4 grade, because shocki qualities or others have made it a No. 4, but they absolutely rest th business in Minneapolis, Chicago, Buffalo, or New York on the ba that it will carry just as safely as No. 1. And in considering t matter of moisture content, anything that does not carry saf should be sample grain.

Dr. DUVEL. That is contrary, however, to the system of inspecti in all of the markets of the United States.

Mr. HELGESEN. Oh, no. In Minneapolis it is that way now. I instance, they would not grade my No. 1 hard wheat at all, whe was No. 1 hard, as the price indicated, because the miller bought but owing to the carrying qualities he pays within half a cent of 1 hard. And yet I could not get a grade at all on account of hav too much moisture, and that was perfectly proper.

Dr. DUVEL. That was wheat with an excess of moisture in it. course, in that case it would properly go into sample grade.

Mr. HELGESEN. That is what I say—that any grade, whethe is 1, 2, 3, or 4, if it has an excessive amount of moisture, sho go into the sample grain. And if it is graded at all, it sho have a moisture content that would permit it to be shipped w safety anywhere.

Mr. STEELE. Mr. Chairman, I believe they have gotten off of question. I would like to know what the department has done regard to establishing these grades with $700,000. As I und stand from the argument, they have practically established grades of corn, but they have not investigated or established grades of any other cereals. Now, if it takes $700,000 to estabi the grades of corn, how much are we going to appropriate h year after year, for the several other grains that we have?

The CHAIRMAN. Dr. Taylor, how much have you spent on t item since 1907?

Dr. TAYLOR. I could not say offhand.

The CHAIRMAN. I wish you would put that in the record.

Dr. TAYLOR. We can ascertain it.

The CHAIRMAN. Since the establishment of this project here?

Dr. TAYLOR. Yes.

The CHAIRMAN. But do not confuse cotton with this, because c ton is carried in another item.

AYLOR. I have not the amount in mind.
HAUGEN. Up to last year it was about $400,000 for grain and ance, $160,000, for cotton. I think it was $389,000 for grain, t year Congress appropriated $76,000 for grain and $80,000 ton, making the total over $707,000.
CHAIRMAN. We should keep those separate, because we are he figures $700,000 here, and it gets into the minds of the com- that $700,000 was spent on this item, when that is not the The amount spent on this item was something like $389,000.
RUBEY. This paragraph says: "For investigating the ng, grading, and transportation of grain, including the grain ms, and the fixing of definite grades thereof." That whole has been appropriated for from year to year and all of this that has been spoken of has been used for all these features.
CHAIRMAN. Exactly.
STEELE. Then, I would like to know whether there have been ades established—any work done and finished.
CHAIRMAN. Let me put my question again to Dr. Duvel. Dr. you have already, out of this appropriation, fixed the stand- corn?
DUVEL. Yes, sir.
CHAIRMAN. You have promulgated those standards and the r the most part is using the standards. Now, are you using ney on corn in the fixing of grades?
DUVEL. Not in the fixing of grades; except checking up to those grades are being applied.
CHAIRMAN. A nominal amount.
DUVEL. Yes, sir.
CHAIRMAN. Several thousand dollars, I take it.
DUVEL. Yes, sir.

CHAIRMAN. Now, then, with regard to your investigation to fixing the standards of wheat and oats; you have brought to a point where with one more year's work you will be in a , you think, to promulgate grades on wheat and oats. That rogress you have made, is that true?
DUVEL. Yes, sir.
HAUGEN. Do you include oats with the wheat?
DUVEL. Yes, sir.
CHAIRMAN. Now, you have made some study, I understand ay, of barley?
UVEL. Practically none of barley.
HAIRMAN. Have you made any on sorghum?
UVEL. We have handled a few samples, mostly from Kansas

HAIRMAN. Any on millet?
DUVEL. No, sir.
HAIRMAN. I understand you do not handle flax?
UVEL. Yes, sir; we handle flax, but we have done very little flax.
HAIRMAN. Alfalfa?
UVEL. The chart to which you are referring is in connection . Briggs's investigations.

The CHAIRMAN. That refers to another item. So that money really has been spent in the fixing of the standards of and in your investigations for the fixing of standards of wheat one including the incidental work you have done with corn money and hay and then the other has been spent in investigation of the handling, grading, and transportation of g

Mr. HAUGEN. Yes, sir.

The CHAIRMAN. Could you segregate for the committee how you have spent on the item for handling, how much for grading how much for the transportation of grain? Could that be done. [illegible]

Mr. HAUGEN. That is really impossible.

The CHAIRMAN. I am inclined to think it is.

Mr. HAUGEN. Because those subjects are handled together.

Mr. HAUGEN. I recommend you to say this work—in this [illegible] going among the fields and studying shocking and sta [illegible] work as you have done—has been incidental and [illegible] the [illegible] standards.

Mr. HAUGEN. Yes, sir; we are going to use all of that inform [illegible]

Mr. HAUGEN. Mr. Chairman, it is proper to charge [illegible] the fixing of standards for grain. Mr. Chairman, in bri [illegible] I have no thought and no intention of delayin [illegible]

The CHAIRMAN. Oh, no; I think you are absolutely right, [illegible]

Mr. HAUGEN. I feel some responsibility in this matter. A nu of years ago some farmers and elevator men came in to see me h Washington. At their suggestion I took the matter up wit committee, and it was included in the appropriation bill. We now appropriated $707,000, and here we are confronted with a ment made by Mr. Jacobson, of the Warehouse Commission o State of Minnesota, a man of experience—a man of probably experience along these lines than any man in the department- comes before this committee and tells us that the standards o Northwest could be fixed in three months and that the standard all the United States could be fixed in seven months.

Now, it seems to me, Mr. Chairman, that with the $707,00 pended and the large amount now asked for for future appro tions, at this period we ought to have some definite informati to what progress has been made. We ought to be able to say t Congress and to the country that we have something to show fo $707,000; so far practically all we have to show is simply the f of the standards on cotton and corn.

Mr. HAUGEN. "If another year is given probably we can establish the standards on wheat and oats," if I remember corr that was exactly the statement made a year ago, the statement two years ago and what we have been told from year to ye believe, Mr. Chairman, we should now have some definite inform as to the progress made.

Mr. HELGESEN. I would like to ask just one question. Suppo pass a Federal grain inspection law now, within the next mon that it would devolve upon you to undertake the inspection of in the whole country (and you know there has been talk of pa

a bill), how long would it take you to undertake that work diligently and profitably?

Dr. DUVEL. That is, if legislation of that kind were enacted, of course, it would be the duty of the department to get together with the trade and agree on a set of standards. It would practically amount to taking over the present inspection departments and the grading on just such grades as they have at the present time.

Mr. HAUGEN. Another thing: unless the standards of grain are authorized by Congress, of what value is this particular work that you are doing?

Dr. DUVEL. Suppose I read here the titles of some of the bulletins and perhaps that will give an idea of some of the work we have been doing. I have one of our circulars here, "Relation between moisture content and shrinkage in grain." We developed a simple method for determining sulphured barley and oats and have prepared a pamphlet on that subject. The trade did not have that method before, and the consumers had no way of determining if they were getting natural grain or bleached grain.

Mr. WILSON. You had a great deal of trouble with that, did you not; that is, the sulphuring of barley and oats?

Dr. DUVEL. Yes, sir; sulphuring has been carried on to a considerable extent.

Mr. ANDERSON. That is to improve the color?

Dr. DUVEL. Yes.

Mr. ANDERSON. Does it affect the quality of the grain?

Dr. DUVEL. That is a question that really has not been determined. To determine a question like that takes a long series of thorough scientific experiments.

Mr. HAWLEY. Did not the Bureau of Chemistry do some work on that?

Dr. DUVEL. Yes, sir. They are doing a considerable amount of work on that now.

The CHAIRMAN. In justice to the witness, let him say what has been done. I think it is only fair to the witness that he be permitted to do that.

Dr. DUVEL. Then, we have been studying the deterioration of corn in storage; that is, the quality of corn that will keep in storage, the various factors that cause it to get out of condition, and so on. Then our bulletin No. 66, the handling of wheat——

Mr. HAUGEN. How many years has the department been studying the question of the deterioration of grain in storage? I have no reference to your particular division; I am speaking of the department.

Dr. DUVEL. I think that work started in 1907.

Mr. HAUGEN. Is it not a fact that it started long before that? Was not that work carried on by the Bureau of Chemistry?

Dr. TAYLOR. I think not, Mr. Haugen.

Mr. HAUGEN. Was not that a matter Dr. Wiley gave particular attention to and elaborated on before the committee here as many as 10, 12, or 15 years ago?

Mr. MCLAUGHLIN. I understand this witness is telling us what publications——

Mr. HAUGEN. I am asking now what time has been consumed on the study of these questions.

Mr. McLAUGHLIN. I understand the witness is giving the publica tions that have been issued as a result of the work done under th appropriation.

The CHAIRMAN. Yes: exactly. And, gentlemen, I think it is onl fair to the witness that he be permitted to do that.

Mr. HAUGEN. I believe it fair to ask as to the time consumed.

Dr. DUVEL. Then we have described a moisture test for grain an other substances, and how to use it.

Further studies of the sulphur-bleaching of commercial oats an barley and the improvement in the oats and the improvement in th grade have been made. That is an important question from th standpoint of market value.

We have issued a bulletin on the shrinkage of corn in storag which has been a serious problem to the elevator operators and to th people who store corn either for themselves or for profit, includin storage on the farm. I suppose scarcely a week goes by that we d not have an inquiry as to the amount of shrinkage in corn whe stored on the farm under different conditions.

A method for determining the specific gravity of wheat and oth cereals is described in another bulletin. This is necessary becau the specific gravity is closely related to the milling value of the whe and indirectly affects the question of grade: not that we want to u it in a system of grading, but these are fundamental facts that a necessary to be known.

Then we have investigated and published on the shrinkage shelled corn while in cars in transit, this being a question which h been much disputed between shippers and receivers ever since gra has been handled.

We have developed a special flask for the purpose of determinin the moisture in flour and meal.

A method has been worked out for determining the acidity i corn, as that is a factor in the question of the soundness of corn an grades for commercial corn.

Then there is Bulletin No. 168, on the corn grades, followed by bulletin describing a special device for sampling grains and oth material. We have studied and described the importance and cha acter of the milled rice imported into the United States, and hav carried on milling and baking tests of wheat containing admixture of rye, corn cockle, kinghead, and vetch, the milling of rice, an the changes in chemical composition as milling progresses, all o which factors must be considered to form a basis for a sound grad ing system.

With your permission, Mr. Chairman, I will insert in the recor a full list of publications of the department relating to grain stand ardization.

(The statement referred to follows:)

Publications on grain-standardization subjects.

BUREAU OF PLANT INDUSTRY CIRCULARS.

No. 32. Moisture Content and Shrinkage in Grain. J. W. T. Duvel. July 1909.

No. 40. A Simple Method of Detecting Sulphured Barley and Oats. W. P. Ca roll. November 30, 1909.

No. 43. The Deterioration of Corn in Storage. J. W. T. Duvel. December 4, 1909.
No. 55. American Export Corn (Maize) in Europe. John D. Shanahan, Clyde E. Leighty, and Emil G. Boerner. March 26, 1910.
No. 68. Handling Wheat from Field to Mill. Leslie A. Fitz. November 14, 1910.
No. 72. A Moisture Tester for Grain and Other Substances and How to Use It. J. W. T. Duvel. November 29, 1910. (Reissued, with supplement, Aug. 29, 1914.)
No. 74. The Sulphur Bleaching of Commercial Oats and Barley. LeRoy M. Smith, March 15, 1911.
No. 81. The Shrinkage of Corn in Storage. J. W. T. Duvel and Laurel Duval. June 5, 1911.
No. 99. A Method for the Determination of the Specific Gravity of Wheat and Other Cereals. C. H. Bailey and L. M. Thomas. August 23, 1912.
—— A Series of Diagrams. (Showing graphically the monthly averages and the variation of the more importnt factors which are taken into consideration in the grading of commercial corn. These diagrams are based on the analyses of samples representing the receipts at terminal markets and shipments from country elevators covering a period mainly from October, 1909, to May, 1913, inclusive.) October 9, 1913.
No. 111. Improved Apparatus for Detecting Sulphured Grain. G. H. Baston. February 1, 1913. (Embodied in Miscellaneous Papers.)

DEPARTMENT BULLETINS.

No. 48. The Shrinkage of Shelled Corn While in Cars in Transit. J. W. T. Duvel and Laurel Duval. December 19, 1913.
No. 56. A Special Flask for the Rapid Determination of Water in Flour and Meal. John H. Cox. January 28, 1914.
No. 102. Acidity as a Factor in Determining the Degree of Soundness of Corn. H. J. Besley and G. H. Baston. July 23, 1914
No. 168. Grades for Commercial Corn. J. W. T. Duvel. July 15, 1915.
No. 287. A Device for Sampling Grain, Seeds, and Other Material. E. G. Boerner. September 14, 1915.
No. 323. Importance and Character of the Milled Rice Imported into the United States. F. B. Wise. December 4, 1915.
No. 328. Milling and Baking Tests of Wheat Containing Admixtures of Rye, Corn Cockle, Kinghead, and Vetch. R. C. Miller. December 30, 1915.
No. 330. The Milling of Rice and Its Mechanical and Chemical Effect Upon the Grain. F. B. Wise (Grain Standardization) and A. W. Bromell (Chemistry Bureau).

SUBMITTED FOR PUBLICATION.

The Characteristics and Quality of Montana Grown Wheat. L. M. Thomas. (As department bulletin.)
The Production and Handling of Grain in the Argentine. Laurel Duval (For Yearbook.)

I might show in that connection one of our sample charts relating to storage work [producing chart]. This represents the amount of work necessary to show the storage quality of corn when stored in bins. This represents a bin of 5,000 bushels which was filled and samples taken at various stages. The black points represent thermometers put into this bin so that we could read the temperatures of the grain as desired during the experiment. The grain at the top had a moisture content of 18.3 per cent, a weight per bushel of 52.8 pounds, and a temperature of 38° when put into the bin, and a temperature of 138° F. when taken out.

In the second 500 bushels [indicating] the temperature increased to 115°.

In the next sample, the third 500 bushels, the temperature increased from 38° to 56°, and from there down the temperature

of the grain in the bin remained practically the same. All of t is of the utmost importance to the men who are going to st grain, whether on the farm, at the country elevator, or in the la warehouses in the terminal markets.

Mr. ANDERSON. What kind of grain was that?

Dr. DUVEL. That was corn.

Mr. STEELE. This is for the purpose, I understand, of benefiti the purchaser to see that he gets a square deal? Is that the idea

Dr. DUVEL. Exactly so.

Mr. STEELE. Have you figured out what profit the farmer make on his corn? It seems that corn is your line. For instan he harvests it in the fall and he throws it on the ground and s it in January and February, as I told you the other day, and course he has a certain amount of moisture there. Now, say cents a bushel is the price of corn; have you determined how he build cribs and how much those cribs will cost him per bushel? figure it will cost him about 4 cents a bushel to build the crib store that corn. Then he keeps the corn over until June or J and the price of corn has risen to 50 cents a bushel. Have you ured out how much money he would make by holding his corn cribbing it, taking into consideration the shrinkage in his corn the time it will take in June and July away from his then pre growing crop and getting the men to thrash this corn and hau to market during his busy season? Have you figured it out, and you send him a bulletin to show him that he can make money holding his corn and cribbing it?

That is an important factor, as I understand, which you wan get at. I figure he won't make any money at 50 cents a bus which is 10 cents a bushel over the price that he would get January and February.

Dr. DUVEL. There are so many things to be taken into consi ation there; that is, the fluctuation in price, etc.

Mr. STEELE. I am making a specific price of 10 cents a bu additional, which he will get in June and July. He probably get 50 cents a bushel in June and July. Now, can he make mo by holding his corn?

Mr. HELGESEN. In other words, how many cents a bushel n would he have to get in July than in January in order to mak pay? That is what you want to know?

Mr. STEELE. That is what I want to know, and that is what poor farmer wants to know.

Mr. REILLY. That is a question the farmer ought to be abl figure out for himself.

Dr. DUVEL. This [indicating on chart] represents the curv corn based on some 54,000 samples, showing exactly what condi the farmer is up against, and that is one of the things we have l studying—to determine the average moisture content—begin back here in 1910. We began in 1909 on this phase of the ques but the curve was not completed because we did not have it du the summer, due to a discontinuance of the work from lack of propriation, and we were not able to complete that curve. from here—November, 1910—through May, 1913, where that c contin across the page, we have the record complete, and, as b this chart, the average moisture content of the g

the farmer filled the country elevator in November, Decem- January, February, and March, coming up to March here, of op of 1910, was right around 19.5 per cent.
e crop of 1911, for the same months—November, December, ary, February, and March—is represented here [indicating on t], being higher than for the crop of 1910. And for the crop 12, which was a dry crop, we have for those five months the ge moisture content still very high, but mostly below 19 per

r. STEELE. I understand that the moisture is high there; we that. But, now, what have you for June and July?
. DUVEL. In June and July, coming down here in the summer, a little over 12 per cent—ranging from 12 to 14 per cent.
r. STEELE. What is the price paid in November, December, ary, and February?
r. DUVEL. The actual value of this corn in December and Janu- was 58.5 cents. Now, if you sell this corn down here in June ly [indicating on chart], it has an actual value of 64⅛ cents.
r. STEELE. Have you taken into consideration cribbage there?
. DUVEL. No, sir.
r. STEELE. But you ought to do that——
. DUVEL. This is purely the moisture content.
r. HELGESEN. You do not mean to say that it has increased in e that much but that it has increased the value that much?
r. DUVEL. It has increased the value that much.
r. HELGESEN. Then the farmer ought to get that much more by ying it?
r. DUVEL. Yes, sir.
r. STEELE. I am asking you to include cribbage.
Dr. DUVEL. That is a matter of mathematics. For instance, if he selling the corn with 19 or 20 per cent moisture content, that is rth actually 58 cents, and in the summer time when that dries t and he is selling corn with 12 to 14 per cent water, he has lost weight, and in comparing the average weights he has to get 64 ts in order to break even. In addition to that, he has another dition—
Mr. STEELE. But have you figured at what he can deliver that rn in January and what he can deliver it for in July or June? hat is an important factor to the farmer.
Dr. DUVEL. That is not figured on this chart.
Mr. HAUGEN. The shrinkage in weight has been about 10 per cent, s it not?
Mr. STEELE. Just a moment. You will understand it will cost him least 4 cents a bushel to deliver his corn in June or July, and it ll cost about 2⅓ cents a bushel to deliver in February and March.
Dr. DUVEL. You have those changing conditions, yes.
Mr. STEELE. Because in February and March he is doing that when is doing nothing else, and the other way he is keeping out of the lds and is losing money.
Mr. HAUGEN. Is it not also the fact that corn often sells at a gher price at the time it contains a higher percentage of moisture an at the time it contains a lower percentage?
Dr. DUVEL. Yes, sir; that is because of the fluctuation in the rices.

Mr. HAUGEN. And moisture has nothing to do with it?

Dr. DUVEL. No, sir: not necessarily.

Mr. HAUGEN. I mean the price of corn fluctuates, that its moisture content has nothing to do with it.

Dr. DUVEL. Very largely. The price of corn may be lower in June or July than in January. Although that ordinarily is not the case, it is possible.

Mr. STEELE. It is that information, I think, the farmer ought to have; and, if you are going to give it to him, that is a consideration which ought to be taken into account.

Dr. DUVEL. That is one of the very things we are trying to get at. And then again, where you deliver corn on the ear the cob contains so much more moisture than the kernel does. As corn in Illinois is marketed in November, the cob often contains 35 per cent of moisture, while the kernels of such ears only contain about 23 to 25 per cent.

Mr. REILLY. After you tell the farmer how much shrinkage there is in the corn, could he not figure that out for himself? I mean, as a general proposition, if you tell a farmer what the corn will shrink from November until June, can he not figure out the rest of it himself? If he can not, then he had better quit farming, that is all.

Dr. DUVEL. That is exactly what they are doing, in the light of this work. We send out a large number of letters every year covering that very point.

Mr. REILLY. On the question Mr. Steele raised of what it is going to cost the farmer to market his corn, does not that depend upon the farmer's closeness to the market and the kind of roads he has? And can you lay down any rule of what it is going to cost the farmer to haul his corn to the market from November to June?

Dr. DUVEL. I think that has been pretty well worked out. I can not give the information offhand. Those figures have been worked out based on average conditions.

Mr. REILLY. Do you think this information is reliable?

Dr. DUVEL. It is based on the average, depending on the kind of roads, the distance from markets, etc.

Mr. REILLY. And it also depends on the help he has?

Dr. DUVEL. Yes, sir.

Mr. REILLY. So that it is impossible for you people to give any real guide and to tell the people definitely about those things?

Dr. DUVEL. That is the object, really—to give them an idea of what it is going to cost under normal or average conditions.

Mr. HELGESEN. There are some members on the committee now who did not hear the testimony of the exporters last year on the corn trade. They admitted that corn exporting very largely establishes the price for the crop that is in the country, and they said that corn came to the exporting points as late as March and not earlier than November, that their demand for export was during the cold weather and they did not dare export after March. Now, if that is true, it is one of the factors that go to establish prices both in the winter and in the summer. There is no export demand in the summer time and the price in the summer time will depend upon local consumption. So, if you establish a price on the wintertime basis of export that is one proposition; but what you are going to get in the summer time depends upon local consumption, which is another; and those

s will have to be taken into consideration. If you are going lk about what corn is worth in the summer time and in the rtime, the one is based on the demand in the foreign markets he other is based on local consumption.

) CHAIRMAN. Is it not a fact, Dr. Duvel, that your line of work establish certain fundamental, scientific facts, and that the r of marketing and distribution and things of that nature are covered in the Office of Markets rather than in your bureau?

DUVEL. Yes, sir; we are trying to stay away from the strictly ting feature.

) CHAIRMAN. And the matters we have just been speaking of atters that are carried on by Mr. Brand, who will be before the ittee shortly, we hope.

DUVEL. Yes, sir; though much of that information has already accumulated in connection with these investigations.

HAUGEN. Price is a matter of speculation, anyway; is it not?

DUVEL. Largely so; yes, sir.

TAYLOR. Mr. Chairman, just at this moment may I say this in that we may all be a little clearer. This work has to do with atter of collecting statistics, and the work was begun upon the of the standardization of grain practically as a result of the of terminal market conditions.

rk was conducted along that line for several years, and it devel- that the basic, fundamental factors with regard to moisture nt, with regard to the behavior of the grain in transit, and with d to the limit of time grain would keep in storage with different ure contents were facts which the department regarded as tial to establishing grades that would be fair and grades that endure. This required investigation, and our work was read- l and based on ascertaining, through a study of conditions in eld, in the cars, in the elevators, and in the ships exactly what acts were, and Dr. Duvel has given a number of the projects ey are there stated, representing an effort to express these sev- lements, all of which bear more or less directly on the standard- n of grades and which also have yielded steadily, as Dr. Duvel ndicated in the list of publications issued, a useful and, we e, a valuable by-product of information to the grain industry, e farmers, the handlers, and the consumers, as we have gone

STEELE. That is the point I wanted to bring out, whether you reached out to the farmer and you are going to benefit him with formation, and then how long it will take you to arrive at this tage and the difference in the price he has to receive for this by holding it over and shelling it out and delivering it at a that it is not opportune for him to do so. Now, he ought to that information. You have taken up the size of cribs, as I stood the other day, and whether he shall build to the north, uth, the east, or west, or how he shall build them. So it seems the department ought not to be very long in arriving at its con- n. With the information they have about moisture content, ns to me it ought not to take you nine years to tell the farmer here is a certain moisture content in this grain, and he must certain cribs, etc.

Now, I am interested in this proposition; I really am: I want t farmer to get these results; but at the same time I do not want be here spending the money of the Government in doing these thi when I think many of them are not appropriate to the question.

Mr. HELGESEN. Dr. Taylor, what did you mean by "grades th will endure"?

Dr. TAYLOR. Grades that will be so fair and so applicable and definitely understood that with a reasonable supervision they can applied universally and fairly to all concerned.

Mr. HELGESEN. You mean the rules laid down: that is what mean.

Dr. TAYLOR. That the grades will be fundamentally sound; t they will rest on principles based on facts, and that will endure.

Mr. HELGESEN. You were not referring to the grain but refer to the rules.

Dr. TAYLOR. No; not that the grain will endure, but the gra grades that will be applicable for season after season in chang conditions; that will be applicable steadily; that will not need t changed from year to year; and that will not be changed from to year; and that will be fair to all.

The CHAIRMAN. That rest upon something fair to everybody.

Dr. TAYLOR. That rest upon facts that are fair beyond any q tion of dispute and not ideas and theories of which we have m with reference to the grain grading, as with reference to many tures we have had to encounter in all investigational work.

Mr. HELGESEN. You will find, not only in the Northwest bu Canada taking a country outside of our own—that they find i necessary to readjust the grading rules to a large extent almost e year. They do not on No. 1 or No. 2, but when it gets to the lo grades they adjust those according to the conditions practically e year.

Dr. TAYLOR. I understand they have a duplicate system.

Mr. HAUGEN. Are you considering fixing grades according to grades fixed in Canada and now in force?

Dr. TAYLOR. Not beyond the point where the facts as develo in the investigation here would justify.

Mr. HAUGEN. The reason I asked that question is that I und stand No. 1 Canadian wheat is selling now for 5 cents a bu above No. 1 northern. Are you considering then the fixing of grade of No. 1 wheat which will conform to the grade of N Canadian wheat, for instance—the same quality?

Dr. TAYLOR. Is that a question of grade?

Mr. HAUGEN. If No. 1 Canadian wheat sells for 5 cents a bu above No. 1 wheat of our grade, I take it the difference is in quality of the grain.

Dr. TAYLOR. Not necessarily in the grade of the grain, Mr. Hau any more than the fact that No. 1 northern sells above a N winter would indicate a difference in the grade. It is a differ in the inherent intrinsic quality of the grain itself.

Mr. HAUGEN. One would be understood to be a No. 1 Canad grain then, and the other a No. 1 American grain?

Dr. TAYLOR. Necessarily so, I think; just as in the case of distinction between spring and winter.

The CHAIRMAN. Now, let Dr. Duvel take up his next item.

HELGESEN. I would like to ask just one more question. What have been obtained in your investigation as to the chemical nt of the grains you refer to—oats and barley?
UVEL. That is, of the bleaching?
AUGEN. Yes.
UVEL. We have found that in the artificial bleaching of oats ley there is an improvement of color. Of course, that is ly why bleaching is done.
AUGEN. Does that improve its quality, or is it simply to e eye?
UVEL. As we see it, it is primarily an improvement in ap-

AUGEN. It does not improve the quality? Chemical treat-s not improve the quality?
UVEL. No, sir; but it improves the appearance.
HAIRMAN. I notice you have temporarily suspended that hich is covered on page 140 of this program book. Why is

UVEL. Because that work was covered pretty thoroughly, improvement primarily in the color, and we developed a whereby they could detect whether oats or barley had been sulphured or not. We have practically covered that field, far as further feeding tests are necessary. The question w as to the value of these sulphured oats for feeding pur-ome contend they are not suitable for feed, and others con-y are, and that is what we want to determine. Two or three o, in cooperation with the Bureau of Animal Industry, we n feeding tests at Bethesda, Md., with some 30 horses, and we selected were from northern Illinois. We had some were in a fairly bad condition, which were bleached, and s grown on the same farm unbleached; that is, oats that were in the field to feed unbleached and damaged oats to feed ; and a small quantity that we fed from that same field were ts secured before being damaged by the rains that season.
HAIRMAN. What result did you get?
UVEL. So far the results of that test are really negligible. d the horses got along practically as well on one kind of n the other; but it is work that should be further continued, it is a question that is of the utmost importance to large nd to large dealers and purchasers of oats.
CLAUGHLIN. Will you tell us briefly what the process of ng grain is?
UVEL. The bleaching tower, some 40 or 50 feet high, is built at the side of the elevator, and within the bleaching ere is a series of deflecting shelves, built in this fashion ing], so that the oats fall onto them, these shelves being o spread the oats. The oats, as they go into the tower, are d, and then they come in contact with the fumes of sulphur-gas, and the sulphur dioxide unites with the moisture on the rming sulphurous acid, which does the bleaching.
CLAUGHLIN. That word "bleaching" is used in the sense ring"?
UVEL. Taking the color out—bleaching the stains.
CLAUGHLIN. And making them white and pure?

Dr. DUVEL. Yes, sir. The trade contends that in bleaching any grain it is to purify it. Of course we readily understand why.

Mr. ANDERSON. Have you come to any conclusion as to what extent the moisture in grain affects its milling value and its shrinkage?

Dr. DUVEL. Most wheat if it is not wet can not be milled, and the higher the moisture content the greater the shrinkage in weight always.

Mr. ANDERSON. There is some shrinkage in weight due to the shrinkage in moisture then?

Dr. DUVEL. Yes, sir.

Mr. ANDERSON. Up to the point where grain will keep, has the moisture any relation to the increase in milling value of the wheat?

Dr. DUVEL. Only to the extent that it affects directly the yield.

Dr. TAWNEY. The yield of the flour.

Dr. DUVEL. The yield of the flour. That is one thing the millers have claimed and do claim—that they do not get the flour yield out of the wheat early in the season that they do later in the season. There is only one way to account for it, and that is because early in the season the wheat contains more moisture and in the milling process that goes off.

Mr. ANDERSON. Have you come to any conclusion with reference to whether or not the moisture content should be considered in determining the grades of wheat?

Dr. DUVEL. I think it should; yes, sir.

Mr. ANDERSON. I want you to understand just what I have in mind. For instance, I take it that it is necessary that there should be some point at which a moisture content should be considered. That point is reached, of course, when sufficient moisture is in the grain to affect its storage. Now, the point I am getting at is whether moisture content ought to affect the determination of whether or not grain is No. 1 or No. 2.

Dr. DUVEL. I believe I can show that better on this chart right here in connection with our corn grades.

Mr. ANDERSON. I want your opinion; I do not care anything about the chart.

Dr. DUVEL. Yes, sir; I do.

Mr. HELGESEN. Regardless of the fact that it may be dry enough to keep under any ordinary conditions?

Dr. DUVEL. Oh, no; not if it is dry enough to keep under ordinary conditions. Then, of course, moisture is not a factor. But I mean between that point and the moisture content where it will not keep. That was very well illustrated last year in the hard and soft winter wheat belt, where they had large quantities of wheat during a particularly wet season which contained a high percentage of moisture, and it went into storage in the farmers' bins—both wheat and oats. A great many of the grain men advised the farmers to leave it in the bin and not to handle it—that it would dry out and cure and would come out in good condition. Now, under certain conditions you can do that, but under others you can not. There is a point some place where it is better to leave wheat and oats in the bin and not handle it, but beyond that point, if the grain is left without handling, it will come out bin-burnt. And we have thousands, if not millions, of bushels in the country, perhaps, in that same condition

where the farmers have not handled it, and it had excess of
e stored. Just what that line is we do not know.
NDERSON. Have you come to any conclusion as to how long
d keep under ordinary conditions with 14 or 15 per cent of
e—that is, any amount of moisture under 14 or 15 per cent,
ase might be—and not affect the grade of the grain?
UVEL. No, sir. That is the standard, the same as we have
rn—14 per cent. While the moisture content of corn gets
wer than 14 per cent sometimes, you have a fluctuation there
thing below that would not affect the grade.
NDERSON. That is what I want to get at.
AWLEY. I would like to make one observation. Reference
n made several times during this discussion this morning to
obson. I heard his statements and listened to them with a
al of interest.
CLAUGHLIN. You mean the gentleman from the Minneapolis
on service?
AWLEY. Yes. Now, then, the statement I understood him
was that he had had an experience of some 25 years han-
ain in his section. Many of these latter years have been spent
fficial position, where he has had the advantage of certain
ry assistance and certain scientific expert assistance; and it
opinion that, with his 25 years of experience and this assist-
has had from the laboratory and the scientific experts, he
tablish grades in that section in three months. And he based
inion on the very long experience and the large amount of
ich he has had.

k it is only fair to the department to say, and to put it into
rd here, that where his statement was made that he could
h the grades in a certain time it was not that he could have
that without any previous information but only after a
riod of experience, with scientific help and assistance other-
But the department went out in this field work covering the
ountry. I doubt whether any one experienced in another sec-
the country could come out into my section of the country,
ve raise an entirely different kind of grain, and establish a
d in three months without any knowledge there and without
g experience before they came. And it seems to me that the
nt regarding Mr. Jacobson ought to go in with that qualifi-
-that he has had a very long practical and a very long official
ice, in which official experience he has been able to avail
of a great deal of laboratory and scientific aid.

HAUGEN. If that statement is to go into the record unchal-
I suggest, to do justice to Mr. Jacobson, that his statement
be printed in the record. My understanding is that he had
e to three practical men. Mr. Jacobson's egotism does not go
extent.

HAWLEY. I do not accuse him of being egotistic.

HAUGEN. I give him credit for his experience and for having
c knowledge with which to go at it; and I give him credit
y particular statement he made us as to his information, and
e also of three practical men and not of himself. But I do not
ith you when you say Mr. Jacobson's experience is limited
Northwest. I take it that his experience goes further than

that, because my understanding is that the members of that commission traveled all over the United States, and I am not sure that they did not go beyond seas. I believe he was a member of the commission of the American representatives to investigate grain in other countries. His experience is not confined to the Northwest, nor to the United States, but he has an experience away beyond that.

Mr. ANDERSON. I think Mr. Jacobson's statement was that men could be gathered from the Northwest who could fix the grades for the grain in the Northwest in three months.

Mr. HAWLEY. He spoke of practical men.

Mr. ANDERSON. Or that practical men with an experience in grain could be gathered from all over the United States who could fix satisfactory grades for the entire United States in seven months. That was his expression.

Mr. MCLAUGHLIN. These conclusions, when they are reached, are more or less arbitrary. I think Dr. Taylor expressed it when he said the department is determined to have such assistance that they can make their grades stand up, so that investigation and trial will show that the grading is right. I do not know very much about this. The chairman hit me exactly when he said the members of this committee are not experts, and he might have gone a good deal further and been perfectly truthful as to me. But it seems to me, after all has been said, that a lot of these conclusions are arbitrary when you get them.

The CHAIRMAN. The testimony of Mr. Jacobson is all printed and before the committee, and the gentlemen can interpret his testimony as they are pleased to interpret it. There are 300 more pages of this program book that we must go over if we are to continue the hearings as we have begun them, namely, to do something that has never been done before—to bring before the committee the men from the department who do the actual work, with an idea of permitting the committee to see the men who do the work and to hear them. But unless we are going to make our questions as snappy and as short as possible we will be here until June on this testimony.

I want these men to have an opportunity to come here; I want to hear them, and I want the committee to hear them, but a discussion on this one proposition could probably go on for two or three weeks and be very profitable to the committee; at the same time we all realize that there is a limit to the cross-examinations in regard to these investigations. Besides, Dr. Duvel will probably have to go over a great deal of this testimony again for the benefit of the subcommittee which has under consideration the grain-grades bill and which will in turn report back to the full committee.

What we are concerned about more particularly now is what is being done in connection with wheat and the other grains and what results have been obtained from the work in that direction. And when the witness has answered the best he can we can not make him say anything else. We must hurry along; I am not impatient with the members for asking questions; I want a full investigation, but within reasonable limits.

Mr. HELGESEN. I think the chairman has been remarkably patient at all times, but I hope he will remember that this grain problem to us is as important as the cotton problem in the South.

The CHAIRMAN. I appreciate that.

Mr. ANDERSON. And it is particularly pertinent now with the bills that are being considered.

The CHAIRMAN. That is all very true. We spent about two days on this matter of cotton, and I appreciate also that the cotton standards have been fixed. I am willing for the committee to go along today on this proposition and get all the information you can out of the witness; but I am saying, for the benefit of all the members, that when we come to the next item, if we spend as much time on that as on this, it will take a month. That is what I want to impress upon the members of the committee.

Mr. HELGESEN. Let me make this statement, now. Perhaps you do not realize it, but there is one little item here which, unless it is properly met and covered by the department in connection with the grading of grain, might mean a loss or a profit to the whole Northwest. It is of vital importance to them, and therefore I think we are entitled to find out as much as we can as to the practical results we can expect. What I would like to know is this: The great Northwest has been favorable, except, perhaps, northern Minnesota, to Federal legislation on this question. They have been favorable to Federal legislation because they hope, from a disinterested source of that kind to get absolute justice and also to get practical results. And yet just this one thing as to whether grain is to be graded according to the dirt that is in it or not is enough to determine whether the great Northwest is going to fight every proposition of this kind or whether they are going to be favorable to it. And if the department intends to go on and grade grain they will have to settle that one thing right at the start; and it does not seem to me that it should take very long to determine whether or not they are going to consider dirt or screenings in the grain in the establishing of grades.

The CHAIRMAN. I think they ought not.

Mr. HELGESEN. That is a thing that could be done very quickly, and I think it ought to be done before dealing with this question at all. Here is a thing that has not been brought out, and I think you can readily see that the farmer is now under a great disadvantage if he ships any dirt in his grain. Why? Because No. 1, No. 2, and No. 3 must weigh so many pounds to the bushel. Now, if he permits any dirt to get into his grain, it will require a better grade of grain and a better quality of grain to weigh that number of pounds than if there was no dirt in it. That is something no inspection system can help. It is up to the farmer, and he must stand that discount or loss if he permits any dirt to be shipped in his grain. But when it reaches the market he wants to know whether he is going to get the grade that his clean grain represents and only lose the couple of pounds or the value of those pounds as dockage. And that is one of the things, it seems to me, that the department ought to be able to settle, and settle very quickly.

Personally, I am for Government supervision, or Government inspection, if we can get it; but I do not know that I would be for either if they are going to grade grain according to the number of pounds of dirt that is in it. It is a very vital thing to our farmers, and because of that I would just like to ask the department if it would not be possible for them to determine whether or not, in grad-

[illegible] grain they are going to take into consideration the screenings or the dirt or chaff that is in the grain in establishing the grade. If they are I am free to say they are going to be up against the greatest opposition they have ever had. If it is No. 1 wheat, with 2 pounds of dirt in it the farmers in my district want it graded as No. 1 hard wheat less 2 pounds and they don't want it graded as No. 2 wheat less 2 pounds or anything else.

The Chairman. It seems to me, not being an expert, that Mr. Helgesen's proposition is absolutely right. If you had a No. 2 wheat and got 2 pounds of dirt in the bushel you ought to have the wheat graded as No. 2 and make the 2 pounds as between the buyer and seller. That seems to me to be a fair proposition, although I am not an expert. What would the department have to say about that?

Dr. Duvel. As I said awhile ago, it is entirely agreeable to the department on that basis, and I think the contention is entirely right.

The Chairman. You think Mr. Helgesen's contention is entirely right?

Dr. Duvel. And that is the system, undoubtedly, which would be applied in the Northwest.

Mr. Steele. For one, I do not want any doubt about it. If we are going to appropriate this money, I want to know that point.

Dr. Duvel. It is rather difficult to say what will be done, but I can say I think it will. As Mr. Helgesen says, you have to take dirt into consideration in some way.

Mr. Helgesen. There is only one sensible way to deal with it at all, and that is an inspection system which will determine how much dirt there is in the grain, and then to stop right there.

Dr. Duvel. I agree with you absolutely in so far as the spring-wheat section is concerned.

Mr. Helgesen. What is the difference whether it is a spring-wheat section or any other section? This is a practical proposition that you can not get around. The thing I want to know is whether I can assure my people, if we turn the inspection system over to you, that you are going to grade grain according to its value as clean grain and then put on the certificate the number of pounds which it ought to be docked, or the percentage which it ought to be docked, for the dirt that is in it.

Dr. Duvel. I think, unquestionably, you can assure your people that very thing, very emphatically.

The Chairman. That seems to settle that proposition now, gentlemen.

Mr. Haugen. Then, I understand the question has been fully determined by the department?

Dr. Duvel. That part of it. As I said to all the grain dealers, at their convention in Peoria last fall, we have canvassed this thing among the grain trade and we think the dockage system is the right system, and the more we look into it the better we like it, because it gives every man an opportunity to see the quality of his grain, he knows how much dirt there is in it, and he knows what he can do with it.

Mr. Haugen. The all-important part is fixing uniform standards?

Dr. Duvel. Yes, sir.

HAUGEN. That is the purpose of the department?
DUVEL. Yes, sir.
HAUGEN. Now, then, does it matter much what that standard
just so everybody may know by what yardstick the value is
scertained?
DUVEL. That is it exactly; the only thing we are trying to
define the length of the yardstick.
HAUGEN. Does it matter whether the yardstick is 36 inches
what the length of it is?
DUVEL. No; just so it is definite. Heretofore the producer has
own. The interpretation has been placed on it by the in-
—whatever he sees fit—and the producer has not been in a
n to know and to properly interpret the grades. We want to
t definite so that he will know and to make it meet the con-
he can fulfill in the ordinary farm practice and under the
r conditions he has to contend with. That is the real sub-
of the whole thing.
CHAIRMAN. All right; that is a very good statement. Now,
you are doing some little work in the study of the quality
ndition of American export grain. Give us a statement on
oposition very briefly. You are spending $1,940 on it.
DUVEL. Those investigations are not being continued very ex-
ly now. The work has been fairly well covered. We know
mount of moisture they will carry with safety, and we know
ality of the grain being exported and why it gets out of
on; and, as a result of our investigations, a number of changes
een made by the steamship companies in their methods of
, etc. The difficulty is, of course, that a great deal of our
s sold on the basis of our certificate being final.
McLAUGHLIN. Do you remember what Mr. Jacobson said on
int. "That grain might be shipped from this country in
ndition and it might reach the outer seaports of Europe in
ndition, but before it gets to its destination it passes through
ry with an atmosphere that makes the grain gather moisture
reaches that ultimate designation in bad condition, and prob-
uld be charged against the sellers in the United States." Do
d any of that difficulty?
DUVEL. Of course there are several factors. There is the
of the quality of the grain at the time it is loaded, the stowage
grain in the steamship when it is loaded, the length of the
, and the time of the year, and what kind of conditions it
meet with over there. I can give you an idea of that on one
charts.
LEE. And he spoke of unloading into barges, too.
McLAUGHLIN. And taking it up the Thames River. I appre-
f course, that conditions on shipboard, and so on, may affect
in when it reaches Europe, but do you find the difficulty that
cobson spoke about—that the conditions over which the seller
trol and the conditions on shipboard are not the only things
fluence the condition of the grain when it reaches the ultimate
tion? Do you find that a good deal of trouble arises from a
ipment that the seller, perhaps, did not contemplate at all,
t he is in no way responsible for and should not be charged

Dr. DUVEL. In this work we have examined a large number of cargoes upon arrival at destination, making definite observations covering the definite quality of the grain that went into every ship and covering the temperatures of the grain during transit and the quality of the grain at the time it was unloaded. We find a considerable quantity of this grain is in bad condition when it arrives.

Mr. ANDERSON. Arrives where?

Dr. DUVEL. When it arrives at the European port. We also find in other cases that the grain will deteriorate by delay in unloading. This deterioration goes on while it is being unloaded, and a great deal of the grain has to be shoveled over before it can be transshipped. But we have not followed grain to points in the interior, because we are not interested in the condition of the grain when it reaches the interior point. We want to know primarily the condition of the grain when it is delivered in Europe at the first port of arrival. The conditions affecting the quality of that grain from point of arrival to point of destination is a European problem. What we are interested in is the condition of the grain when it is first discharged at the first European port, because there the complaints coming back to our own growers and dealers originate.

Mr. SEARLE. Your investigation, so far as that is concerned, is finished; you have finished that feature?

Dr. DUVEL. On the corn work we have finished that. We have done a little work on wheat along that line—as to the carrying qualities of the wheat—but that is a less important factor, because wheat does not carry the amount of moisture——

Mr. SEARLE. You propose to spend $1,900 on that work this year?

Dr. DUVEL. Yes; to check up work already completed and to keep in touch with the quality of grain that is being shipped.

Mr. HELGESEN. No. 2 wheat seems to be the contract grade both in this country and Europe?

Dr. DUVEL. That is, winter wheat; yes, sir.

Mr. HELGESEN. It is not a hard wheat?

Dr. DUVEL. No. 1 spring wheat.

Mr. HELGESEN. Oh, no; No. 2. They mix everything with No. 2 in our country; no matter what they buy, they always mix it with No. 2. Have you made any investigation as to the relative actual value of the grain that is sold in Europe as No. 2, or our export grade, and the value of the grain that is bought from the farmer in this country for No. 2?

Dr. DUVEL. Yes, sir; we have taken that into consideration; not so much in wheat as in the case of corn, but the same principle applies there. Of course, I think it is a generally known fact, an admitted fact, that the export grain is not of the same standard as the grain bought from the grower under the same grade.

Mr. HELGESEN. Now, Mr. Chairman, when we met last year with the exporters here we put that up to them, and you will all remember if you remember back a little, that the buyers of our grain, of our wheat in Europe were so dissatisfied with the grades they got from this country that they appealed to the Government and finally appealed to the President, and they also admitted that they did not have the same values. We all know that, when you go to a grain buyer in this country and ask him what No. 2 wheat is worth, he will give you a fixed price, and you will say, "Why is No. 2 worth

will say, $1 a bushel." They say, "Because so much of it goes to Liverpool and the Liverpool price is so much, and the cost of transportation is so much, and that leaves it worth so much here."

Now, if the actual value of that wheat at Liverpool is less than the actual value of our wheat, they have undergraded the entire crop in this country. It is a very vital question, and I would suggest under this appropriation that you should devote a good part of it to finding out whether or not we are getting a square deal in our European grades. If not, something has got to be done, because I am satisfied that in the past 40 or 50 years hundreds of millions of dollars have been taken away from the United States just through that very system of the exporters shipping grain abroad that is not what it is represented to be; yet our buyers, who buy from the farmers, base their price upon the European price—upon the so-called No. 2 in Europe. And we do not want any hearsay on this; we would like to have the Government investigate that, so that next year, or sooner, we can have the absolute facts as to that.

Mr. HAUGEN. Mr. Chairman, is it not a fact that the European buyer buys subject to American inspection?

Dr. DUVEL. He buys on our certificate final almost always.

Mr. HELGESEN. Yes; but what good does that do when the exporters themselves said here that in dealing with corn they buy No. 3 and No. 4, because, on account of the climatic conditions, as they claim, the weather being cold, it would carry in the wintertime, and they could not sell No. 3 or No. 4 corn for No. 2—what they call, according to some, "export No. 2," or, according to others, "seaboard No. 2"; but when you get your price for corn wired to you from Liverpool it is for No. 2, and they are getting from this country for their No. 2 what is only our No. 3 and No. 4. Yet the price of our actual No. 2 is determined from the price of the inferior No. 2 in Europe. You can thus see the importance of that to our corn country here if you cut the price of the corn only one grade on over 3,000,000,000 bushels of corn; you can see the enormous amount of loss to the American farmer. And that is what we want to know. Of course, this particular American grade is not a Government grade; it is not a State grade; it is not anybody's grade now except the exporters; and they say they have established a grade that was fairly satisfactory. Perhaps they can unload it. That is true. But if our actual prices are to be based on the inferior grade over there, it means hundreds of millions of dollars in the course of a few years to the growers of wheat, oats, and barley raised in this country.

Mr. RUBEY. The committee will remember the last time we had up the proposition of establishing uniform grades, the grain-grading bill, that the exporters are the men that came here and opposed the passage of that sort of measure and did so because it would interfere with their doing just that same sort of thing. Is not that a fact?

Mr. HELGESEN. Yes; and asked how it interfered with them, they said it took a way from them their climatic advantage. Asked what they meant by that, they said that corn does not reach the seaport until cold weather sets in, and that it is nearly all shipped abroad in the winter, and that they can ship out corn No. 4 as No. 2. And yet that No. 2, which is a very inferior grade, is quoted back to us by Liverpool and establishes the price of our No. 2 in this country.

Mr. [illegible] And it affects the growers, and they have to take that [illegible] less for their grain.

Mr. [illegible] that we are simply trying to have sold on the basis of the Liverpool grade, and the wheat country is just as much interested in this matter as the wheat people are, as the corn crop is larger than the wheat crop [illegible] three times.

Mr. Lee. How will you get the farmer to pay more?

Mr. Haugen. It is the easiest thing in the world. After it has had inspection that will not only help the interior grower but for the exporter. He will have to furnish the grade he represents he furnishes to the foreigners, and then that would not occur. The Liverpool buyer would get our actual No. 2 when he buys No. 2, and when the quotation that comes back from Liverpool it would come back for the actual No. 2 and not the Liverpool grade. Of course, the exporters object to coming under this bill because it would prevent them from doing that kind of rascality right along.

Mr. Rubey. I am reading from the hearings we had before the committee last year, from a statement made by a gentleman by the name of Eddy, an exporter. He says, in response to a question asked him by Mr. Haugen:

Mr. H[illegible] To get [illegible] directly to the proposition do you receive No. 3 and [illegible] as No. 2?

Mr. Eddy. We buy No. 3 in the West and make it as No. 2 for export.

Mr. Haugen. You raise it a grade in transit between Chicago and Boston for export?

Mr. Eddy. It is raised at the seaboard.

Now, that is the whole point there. They go into the West and they buy grain which is 3 and 4 and when they export it they export it as No. 2. If we have a regulation, uniform grades, and Government supervision, we can prevet the exporter from doing that.

Mr. McLaughlin. Does not that mean that our grades and the grades in Europe are substantially the same but that the exporters call it No. 2 when it is really No. 3, when it goes to Europe, and that the purchaser and inspector there finds it is actually No. 3 and he calls it No. 3?

Mr. Rubey. That is done for the purpose of giving the exporter the advantage of what he makes out of No. 2 and what he pays for No. 3.

Mr. Heflin. As I understand it, it is not called No. 3 there; he calls it No. 2.

Mr. Anderson. And pays for it as No. 2.

Mr. Helgesen. No; he does not. If he had to pay for it as No. 2, there would be no harm done. But you are all sensible enough to know that the people who buy corn over in Europe are not going to pay more than that corn is actually worth. No matter what the exporter calls it, they will pay the price it is actually worth. When it is billed for No. 2 and they pay what they are otherwise paying for 3, if it was properly inspected, it would reduce the value there one grade, and, our price being quoted on the Liverpool price, with the charges over there, it reduces our No. 2 to No. 3, and our No. 2 is paid for at their No. 3 price.

Mr. Heflin. And the farmer is injured by that.

Mr. Helgesen. Yes; the farmer and the grower and everybody in the country have stood that loss for a number of years. And nobody knew it until they came here and we found it out. If you

remember, and will go through that book, you will see that we cornered nearly avery man that came before the committee here and they said sometimes they shipped No. 4. Just let me suggest this, and then I am through. Important as this is to the whole country, North and South, I would suggest that the department give special attention to that investigation, and if $1,900 s not enough, we can afford to pay $19,000. That is not the uestion, because the amount involved and the loss to the country s enormous all the time; so we can well afford to have an investigation made. And if the department finds it can not make t on $1,900, I would be perfectly willing to raise the amount. But I would like to have it done as quickly as possible so that we an know what we are up against.

Mr. HAUGEN. We have now got the highest authority to be had on he subject, the exporters themselves. They came before the committee, and they said they bought No. 3 corn and advanced it to No. at the seaboard. Is it not the fact that the lack of European confidence in our grading is due to the manipulation of the grading by he exporters, largely, at the seaboard?

Dr. DUVEL. It is more the seaboard exporter, because the exported rain usually goes out on the seaboard certificate, but not necesarily so.

Mr. HAUGEN. I did not quite get that.

Dr. DUVEL. Whatever certificate it bears, most export grain goes ut on the seaboard certificate, but not necessarily so. A great deal f it goes out on the Chicago certificate or the Duluth certificate, or ie Minneapolis certificate.

Mr. HAUGEN. What proportion goes out on the seaboard certifiate?

Dr. DUVEL. I could not say as to that. I do not know that we can nd out; but we find a great deal going through those markets on estern certificates, and that practice is increasing.

Mr. HELGESEN. I may just give a little statement, which I think ay interest the committee, by a gentleman who deals with these xport grades and also with the question of dockage. After we had he exporters before the committee last year, a friend of mine, who s now the manager for one of the very largest barley-buying conerns in the country, came to visit us. I told him this story and asked im if he did not think that some kind of a grading bill ought to be dopted by the Federal Government under those conditions, and he aid, "Certainly." He said, "Mr. Helgesen, I can hold my own with ny man on earth in handling grain and selling it if I can get a quare deal. But," he said, "under the system prevailing now that s absolutely impossible." And he gave me this illustration: He aid: "Being very large barley exporters, we have our regular cusomers, and we know what quality of barley our customer wants, nd we have our list ready in the fall to offer to him." He said, 'Last year"—which is now two years ago, I guess—"we found we ould not get any buyers, and we began to investigate and ask why t was." And he said they were told, "Because we can buy No. 2 arley elsewhere at less than you offer it to us." Now, he said he new that was not true unless there was something connected with t that was not proper, and he said, "I discovered they bought it at Milwaukee, so I sent a man to the best house in Milwaukee to find ut what the trouble was, and he wired back and said there was no

[illegible] that they were all [illegible] the way f [illegible] ent. of it in it [illegible] and they will [illegible] An [illegible] Well [illegible] one is the one who sel [illegible]

[illegible] and [illegible] the [illegible] when [illegible] made. [illegible] the [illegible] imagina [illegible] and that if it conta [illegible] and I believe some [illegible] were cr [illegible] of the time—and, "Now," he says, "I wa going to get straight, so I will tell you what I did. We shipped [illegible] to the export house on the seaboard a certain quantity. [illegible] we bought what we thought was good wheat and i [illegible] did not get enough we shipped [illegible] and wh [illegible] putting the grain in the ship we ran a stream of dirt in [illegible] the amount put in we were [illegible]

Now, that grain went to Liverpool, and here is where the doc [illegible] comes in. If they had [illegible] according to the n western system, so many pounds, it would not have made any [illegible] difference to us in this country, because then they would [illegible] the price for their No. 2 barley. But over there they do not [illegible] —— they refuse the p And if that No. 2 barley came to Liverpool and was docked in [illegible] 1s. 2d. or 2s. or 3s. cents, what does it mean? It means that they [illegible] that much less for their barley than would be paid abr And [illegible] the price of the real No. 2 barley, clear, in this country according to the No. 2 that was sold in Liverpool, and, of cours would be very much below what it would have been if it had clear. This is a tremendous proposition. Outside of cotton, w I do not know anything about, nothing has ever been before this mittee which is as vital a matter to the country as the questio properly grading and the prevention of swindling along those l

Mr. HEFLIN. Would it be well for us to pass an act making it lawful for any man to ship grain from this country to anc country and calling it No. 2 when under our standard it was 3 or No. 4?

Mr. HUTCHESON. You can not do that unless you establish a gra system in this country.

Mr. HEFLIN. That is what I say—establish a standard of gra

Mr. HUTCHESON. There is no grading now except the grading th given by the exporter, and he calls it his private grade. They ca as some of them said, "No. 2 Seaboard" or "No. 2 Export." T are only four export points on the Atlantic coast—Baltimore, [illegible] delphia, New York, and Boston. If they all have the same [illegible] there, and it is called No. 2 grade from this country, we would to have a public man present and the grain must be graded int ship when it goes according to our standard.

The CHAIRMAN. Please take up your next item. "Quality and dition of grain imported into the United States." You have [illegible] an appropriation of $500. The next item you have is "Dete

ion of export grain during transit in steamships," where you have allotment; and then you have "Deterioration of grain in storage d during transit in cars," for which you have an allotment of 950. Briefly, what are those items?

Dr. DUVEL. In that connection we are studying all deterioration. nd for the import corn, in the last two years there has been quite good deal of Argentina corn coming in, and we have been making vestigations to find out the quality of the corn that comes in, ause it comes in direct competition with ours. We have exined some 20 or 25 cargoes, both at the Gulf ports and on the Atntic, and we feel that this phase of the work has been pretty well vered, so that only a small expenditure is necessary.

Mr. HELGESEN. How does that Argentina corn compare with ours?

Dr. DUVEL. The Argentina corn, on our analysis, shows about 5 r cent less moisture when it comes in, a little higher percentage protein, and a higher percentage of fat in comparison with our mmercial corn when it goes on the market. It is necessary, of urse, to keep in mind that these analyses are not on the basis of rn selected for seed purposes. I mean we are comparing one comrcial corn with another.

Mr. HELGESEN. You have given a scientific answer, but have you mpared Argentina corn for feeding purposes or anything of that nd; and, if so, about what is its value as compared with our corn?

Dr. DUVEL. Of course, all of it practically comes in shelled, and u practically have to grind that corn before feeding it, and most of that comes in is ground before feeding. Of course, the bulk of it es to manufacturing plants and is converted into glucose, corn l, starch, feeds, and other manufactured corn products.

Mr. HELGESEN. How would it compare in value to the consumer this country?

Dr. DUVEL. It is my understanding that the Corn Products Co., in ew York, manufacturers of glucose, corn oil, and so on, have found at it is a little better than our corn if they get it in good condion. But it does not always come in in good condition.

Mr. HELGESEN. Approximately how many cents more is it worth?

Dr. DUVEL. Sometimes it is less.

Mr. HELGESEN. I am talking about the actual value of the corn.

Dr. DUVEL. On the basis of the difference in the moisture content f about 5 per cent the corn would be worth approximately 4½ cents ore—that is, the intrinsic value—to a man making alcohol or ything of that kind. It will run about three-quarters of 1 per nt higher in oil, and corn oil is one of the highest priced products; d it will run on the average from a half to three-quarters of 1 r cent more in protein.

Mr. HAUGEN. Are we to understand that it has been scientifically termined that it has a greater value than our corn?

Dr. DUVEL. That is based on chemical analyses of three or four ndred samples, and I should say on 20 different cargoes that have me in through different ports of entry.

Mr. HAUGEN. Of greater value to what extent? You said 5 per nt moisture—take everything into consideration.

Mr. STEELE. That would be 4½ cents a bushel?

Dr. DUVEL. At the present price of corn.

Mr. HAUGEN. What value as compared with the value of Amerin corn?

The CHAIRMAN. Four and a half cents, didn't he say?

Mr. HAUGEN. No; that is a mistake. I want to get its exact value.

The CHAIRMAN. Of course, all of this corn does not come in in good condition.

Mr. HAUGEN. That is another question.

Mr. HAUGEN. How many cents a bushel?

The CHAIRMAN. I want to get the figure except on the moisture content, because I do not know the value of these various byproducts. Of course, the percentage of oil in corn that they recover in the manufacture from it is relatively small.

Mr. HAUGEN. The oil has a value as a fuel.

Mr. HAUGEN. Can you not give it to us in percentages? You have given us so many per cent for oil, so many per cent for something else. You can get the percentages, and then it would not make any difference what the price is. You have 5 per cent moisture, 8 per cent something else. If you could put that all together——

Dr. DUVEL. I have a table here showing the analysis. I would be glad to put that in the record, showing the analysis of the Argentine corn.

Mr. HAUGEN. What is the average moisture content of Argentine corn? About 12 per cent, is it?

Dr. DUVEL. It will run about 14 per cent, on the average.

Mr. HAUGEN. You stated before the committee last year, I think, that it was 12 per cent.

Dr. DUVEL. I would have to look that up to know exactly.

Mr. STEELE. Twelve to 14 per cent; is that the idea?

Dr. DUVEL. I have here a table showing the analysis of 105 samples, representing 9 cargoes of the 1913 crop as discharged at New York, with similar data on the American corn as loaded for export.

Mr. HELGESEN. That is as meaningless to the farmer as to anybody else. If you are buying corn for the Corn Products Co., how many cents more could you afford to pay for Argentine corn than for American corn?

Dr. DUVEL. As I say, I can not give it offhand, because that requires some calculation.

The CHAIRMAN. Can you put it in the record? That is an interesting question.

Dr. DUVEL. I do not know that I can even put it in the record, any more than to make a comparison of the relative differences as it all bears on the value of those products.

Mr. HELGESEN. You know the percentage of oil corn contains in our country, and if that contains 1½ per cent more you know the value of that.

Dr. DUVEL. But I do not know exactly, and I do not know that I can find out the amount of oil they will recover. I think it is about 3 per cent that they get out of their corn—a 3 per cent yield of oil.

Mr. HAUGEN. Three and a half per cent of oil?

Dr. DUVEL. That is, the total yield of oil in corn that they can extract is about 3 per cent.

Mr. HAUGEN. That is the total; it does not represent the increase?

Dr. DUVEL. No, sir.

Mr. HAUGEN. Now, then, what is the percentage of oil in the American corn?

Dr. DUVEL. It runs about three-quarters of 1 per cent less than Argentina corn.

Mr. HAUGEN. What is the other constituent—the fat, you say? How do they compare in fat?

Dr. DUVEL. The fat is the same thing as the oil; it runs a little higher than in our corn.

Mr. HELGESEN. Do the best you can to give an answer understandingly and put it in the record.

The CHAIRMAN. I wish you would do that.

(The statement referred to follows:)

STATEMENT SHOWING COMPARISON OF ARGENTINE CORN WITH AMERICAN CORN AS REGARDS QUALITY AND VALUE.

Samples taken from 36 cargoes of Argentine corn as discharged at Atlantic and Gulf ports showed an average moisture content of 13.6 per cent, which is slightly more than 5 per cent less than the moisture content of our corn as loaded for export on the Atlantic seaboard. At the present high price of corn at New York there is a difference in intrinsic value of about 5 cents per bushel in favor of the Argentine corn on the basis of moisture content alone.

The Argentine corn also showed a higher yield of oil and a higher protein content than our American corn as loaded for export. The following table shows the result of analyses on samples representing both the Argentine and the American corn:

Statement showing comparative chemical composition of Argentine flint corn, as discharged at New York, and North American dent corn, as loaded for export and as received at export markets, calculated to a water-free basis.

	Argentine corn.		North American corn.	
	Crop of 1913. Average of 105 samples representing 9 cargoes discharged in February and March, 1914.	Crop of 1912. Average of 98 samples representing 4 cargoes as imported at New York.	Crops of 1910 and 1911, as loaded for export.	Crop of 1913, as received at export markets—average of all grades.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Ash	1.71	1.72	1.43	1.43
Ether extract (oil)	5.05	5.52	4.07	4.26
Protein	10.83	11.01	9.81	9.87
Crude fiber	2.17	1.99	2.18	2.35
Pentosans	6.13	6.02	6.19	6.26
Invert sugar	0.21	0.30	0.38	0.27
Sucrose	1.02	1.08	1.13	1.32
Acid, calculated as acetic	0.34	0.33	0.28	0.26
Undetermined	72.67	72.03	74.53	73.98

The data showing the quality recovered by the Corn Products Refining Co., which has used most of the corn from Argentina, are not available, and it is not possible, therefore, to give the superior value of the corn from Argentina for manufacturing purposes as a result of the high oil content. In 1914 the amount of corn oil exported is shown as 18,281,576 pounds, valued at $1,307,204, the price per pound being a little over 7 cents. Moreover, the higher yield in oil is necessarily accompanied by a reduction of some of the other products, and this must likewise be taken into consideration. These data can be secured only from the manufacturing plants.

The CHAIRMAN. Now, take up "shrinkage of grain while in storage and transit." You seem to have no allotment for that work, the note being "work temporarily suspended."

The next is "keeping qualities of grain as influenced by various kinds of storage bins." There is no allotment there, the note being "work temporarily suspended."

The next is "artificial drying of grain": no allotment: work t
porarily suspended.

Why is that work temporarily suspended? What do you mea
that?

Dr. DUVEL. These are items that we have covered pretty wel
previous years. We know the amount of grain dried and how
do the drying. However, this year we are spending some mone
that project for drying, doing special work in reference to the dr
of wheat to remove garlic.

The CHAIRMAN. In other words, you have practically compl
these three items?

Dr. DUVEL. Yes, sir: on the standards for corn: but, in cor
tion with the agitation for legislation for uniform standards
supervision, we feel it necessary for the best interests of the cou
as a whole to concentrate on some of the other features, to get
more important fundamental facts.

The CHAIRMAN. On the next page you have "bleaching of gr
You have already spoken of that. This says, "work tempor
suspended."

Dr. DUVEL. Yes, sir.

The CHAIRMAN. The next is, "mixing of varieties, classes, and
mercial grades of corn." You seem to have an estimated appr
ation there of $3,250. Briefly, what are you proposing to do the

Dr. DUVEL. In that case we are studying the mixing of grai
elevator companies at the terminal markets, the mixing of gra
country elevators, and also the mixing of grain on the farm-
various classes of mixtures and the peculiar conditions which d
mine the purity of the grain they can grow under good condit
so that we can correlate the farm conditions with the amou
mixing that is done in the elevators.

The CHAIRMAN. For determining what?

Dr. DUVEL. It is to determine the amount of other grain that sh
be allowed in any given grade—that should be allowed to pass
grade.

The CHAIRMAN. It is also incident to the grade factors?

Dr. DUVEL. Yes, sir; that question is very well brought up a
present time on account of the mixture of spring wheat and d
wheat, which is a matter of great importance in connection wit
grading of durum wheat in this country at the present time.

Mr. HELGESEN. That is a very important question in our S
Mr. Chairman, the mixing of the varieties. It is one thing to
grade and another to mix varieties. We raise a lot of durum w
in our country, and it is utterly impossible to keep it absolutely
because the fields that have been sowed to hard wheat or spring w
the year before have a little volunteer growth, and it is absol
impossible to keep it from mixing, in spite of anything we ca
and our grading statute allows 10 per cent in the macaroni w
without affecting its grade. I would like to have a statement
you as to what is proper.

Mr. MCLAUGHLIN. Does that volunteer seeding last throug
winter?

Mr. HELGESEN. Oh, yes.

Mr. MCLAUGHLIN. Of spring wheat?

Mr. HELGESEN. Yes.

CHAIRMAN. Can you give Mr. Helgesen a statement as to
ou have in mind on this proposition?
DUVEL. The proposition there has been simply to study this
ith the idea of fixing the grades on a basis that the farmer can
Now, on the question of the Minnesota grades, I think in the
tion of the grades, as has been stated to me personally, and
Helgesen has said, they pass wheat as No. 1 durum with 10
t. We believe, if they pass durum wheat with 10 per cent
wheat in it that the grade rule ought to be so stated, so that
ner and everybody will know what they pass. As a matter of
onsiderable quantity of the No. 1 durum wheat under Minne-
pection carries more than 10 per cent of other spring wheat,
ie grade rules provide No. 1 durum wheat "shall be bright,
dry, well-cleaned, and be composed of durum, commonly
as macaroni wheat, and weigh not less than 60 pounds to the
d bushel." The rule does not indicate in any way that 10
spring wheat or more will be allowed in this grade.
HELGESEN. The question is, Do you think it ought to affect
le if it has only a sprinkling?
DUVEL. No, sir; I do not. Still, we are undertaking in this
ation to find out what percentage should be allowed before it
affect the grade.
HELGESEN. The bulk of durum wheat now is used for milling,
kes the best grade of hard-wheat flour in this country. That
be the only demand for it, but now it is being used by the mills
the coast with soft wheat. Durum wheat from our country
some little amount of hard wheat, and that hard wheat for
is worth more per bushel than the macaroni wheat itself.
caroni plants used to buy all of our wheat, and at one time it
cents between that and spring wheat. Then it went up until
difference is only 6 or 7 cents; but it is still cheaper. Now,
no one who is going to deliberately mix spring wheat with
ni wheat, and therefore the only amount which it should be
ed to contain would be this amount which the farmer can not
ause of the fact of its getting mixed through volunteer crops.
long as the millers buy and mix with the lower grades of
if there is a sprinkling in it which is worth more than the
ni and more than soft wheat when they mix it, I contend it
ot do any harm for milling purposes. The milling people are
ones who could object to it, and I understand that they have
ar objected to 10 per cent. And I sincerely hope, when you
s matter up, that you will be careful not to get that so low as
e the grade of our wheat below what it ought to be.
DUVEL. That is exactly what we want to guard against, and
xactly why we are doing this work—going out into the fields
dying these conditions, so that they won't be too high and
ll the durum wheat out and yet fix the standard on some
basis.
HELGESEN. If the miller wants macaroni wheat, he ought not
mpelled to take anything in it, but practically they mix it
ey buy it and they mix it with a grade of wheat worth far
n spring or durum. Therefore, in getting this little volunteer
ng nobody loses anything; the miller loses nothing. As a
f fact, he secures by that sprinkling a higher grade of wheat

than he buys, and even a higher grade of wheat than the grain he mixes.

Mr. HAUGEN. What information can you give the committee as to the condition and quality of corn for this last year's crop?

Dr. DUVEL. Taking the bulk of the corn from the corn belt proper it is, of course, of a low quality. Taking it as a whole——

Mr. HAUGEN. What is the quality of corn from Iowa, for instance, this year?

Dr. DUVEL. I could not give Iowa by itself.

Mr. HAUGEN. Take it by States and start in with Minnesota, for instance.

Dr. DUVEL. Take all of the corn from Minnesota and the Dakotas and northern Illinois and a good share of Iowa, all of that section has a good deal of very soft corn. We have samples which we have received running in moisture content anywhere from 25 to 36 and 37 per cent. A good deal of that corn has been frozen.

Mr. HAUGEN. Is there any considerable amount less than 30 per cent moisture?

Dr. DUVEL. Not in that section.

Mr. HAUGEN. Take it in the central corn belt.

Dr. DUVEL. From the line of central Illinois south, that corn is coming in in very good condition.

Mr. HAUGEN. What percentage of moisture?

Dr. DUVEL. I would have to look that up in our records to show just how that is running.

Mr. HAUGEN. In the northern belt what does it grade?

Dr. DUVEL. The corn that has been coming into Chicago has been averaging about 22 per cent, as compared with 16½ for a corresponding period last year.

Mr. HAUGEN. How is that graded? How is the corn from the northern section graded? What grade do you give it?

Dr. DUVEL. I suppose all that northern corn would probably go into the sample grade, on account of being frosted. I do not know. I would have to look up those records from Chicago and our other laboratories.

Mr. HAUGEN. The fact that corn from the northern sections is selling from about $8 to $10 a ton would indicate that it would not be of any great value?

Dr. DUVEL. No; not of a very great value. A lot of the feeders, I understand, have refused to feed it. I do not know whether there is any truth in it.

Mr. HAUGEN. To what extent does that go—the poor quality of corn? How far south does it extend?

Dr. DUVEL. From North Dakota south; that poor condition catches the northern part of Illinois and part of Iowa. I do not know just how far it extends down into Iowa, and from that on.

Mr. HAUGEN. It is pretty well down south in the State.

Dr. DUVEL. I guess it is pretty well down into the State. I know Iowa people, from what I have been told by men in that section, have been buying corn to feed.

Mr. HAUGEN. And shipping in carloads?

Dr. DUVEL. Yes, sir.

The CHAIRMAN. Take up the next item, "milling and baking investigations with various classes, varieties, and grades of wheat."

ve an appropriation there of quite a considerable sum. what do you propose to do with that?

UVEL. In that work we are trying to get at some funda- principles that will be used in establishing grades based on ing value of the different classes and grades of wheat as dled, wheat being used almost exclusively for milling pur- o determine the milling and baking value and correlate the f these actual tests with the general appearance and quality heat, taking into consideration the factors used in grading.

HAIRMAN. The next is "Dockage as a factor in grain grad- ou have practically covered that item?

UVEL. Yes, sir.

HAIRMAN. "Feeding and manufacturing value of sound and grain." You told us about feeding grain to horses out at s on that?

UVEL. Yes, sir; in cooperation with the Bureau of Animal . In the feeding tests we used different lots of corn. We d corn, three grades of heat-damaged corn, and one lot of l corn, such as is known in the trade as cob-rotten corn. arious lots were fed to hogs, sheep, and poultry.

HAIRMAN. Did you get some results?

UVEL. We got some very interesting results in that test, show- ed differences in the increase in weight of the animals.

HAIRMAN. What, in a general way, did that show?

UVEL. It showed, for badly heat-damaged corn, for instance, y did not make the increased gain in weight as from good rn. This investigation was carried on to find out how that l corn should be classed when making the grades, what weight e given to such factors.

[cLAUGHLIN. Damaged how? What kind of damage?

UVEL. That is what is known as cob-rotten corn—that is, corn l on the ear—having rotten and moldy kernels, which go mercial corn. Some of the corn used in these tests was what l heat-damaged corn, and one lot of it was what we call ay corn, this being badly discolored.

HAIRMAN. The next is "Grain values as influenced by bio- l changes which take place after harvesting and during " That seems to be practically completed?

UVEL. No, sir; we have never done very much on that project.

HAIRMAN. You are just beginning it, then?

UVEL. It is a scientific problem that needs really a long series of special research work. It is an important problem, how- l a problem about which but little is known from a scientific view. We merely do a little under this item, in cooperation ier people who are interested; we aim to do just enough on ject to assist other investigators who are making more de- udies along that line. We really have not gone into that our- ecause we do not consider it one of our important problems ime.

HAIRMAN. Your next project is "Changes in chemical com- of grain during deterioration." That also, I take it, is a research proposition, is it?

UVEL. Yes, sir. Take export grain, a great deal of that has red under different conditions and harvested under different

conditions. This project is handled in cooperation with the Bureau of Chemistry. We have had chemical analyses made to see what changes have taken place as a result of different methods of harvesting, storing, shipping, etc.

The CHAIRMAN. The next is "Development of laboratory methods in the determination of soundness of grain." What do you mean by that?

Dr. DUVEL. I think we can take that and the next project together. These are simply for the purpose of grouping our work relating to the development of new methods and equipment. In that connection we have developed a moisture tester, which is now used quite extensively both in the States and in foreign countries. We have just recently published a bulletin describing a new mixing machine. One of our difficulties has been to secure a uniform sample for analysis, and Mr. Boerner, of our office, has worked out a method whereby such samples can be secured better than by any method heretofore in use.

Mr. ANDERSON. Are you referring now to corn or grain in general?

Dr. DUVEL. All grain. We have also developed a means of testing the weight per bushel, which has always been a factor in grading and a factor in which there is considerable variation. We are trying to get some uniform method which can be easily applied by anyone.

The CHAIRMAN. Now, Dr. Duvel, if the committee has no further questions, I want to ask you just two or three questions on your increases. Mr. Haugen, have you any further questions?

Mr. HAUGEN. I would like to ask Dr. Taylor if the investigation on the artificial curing of alfalfa comes under your bureau?

Dr. TAYLOR. No, sir. There was certain work done some years ago in the Bureau of Plant Industry under farm management with reference to artificial drying of alfalfa.

Mr. HAUGEN. Is that work being carried on now by any bureau in your department?

Dr. TAYLOR. Not by the Bureau of Plant Industry; possibly that is being done in the Office of Farm Management, although Dr. Spillman would have to answer that.

The CHAIRMAN. I am under the impression that work on hay curing is being done by Dr. Spillman.

Mr. DOOLITTLE. Do you know whether any of this work is being continued in any branch of the department?

Dr. TAYLOR. That is, the alfalfa-drying work?

Mr. DOOLITTLE. The artificial curing.

Dr. TAYLOR. I am not aware there is such work now under way.

The CHAIRMAN. It is my understanding that that work on hay curing is being carried on in the Office of Farm Management under their project "Crop economics."

Now, Dr. Duvel, let me ask you a few questions. Your increases amount to $37,000. You want $25,000 to establish three new standardization laboratories. Is the establishment of the laboratories absolutely necessary to the hastening of your work in establishing these grades?

Dr. DUVEL. Yes, sir. When we say we want to go ahead and wind up these features, that, of course, takes into consideration that we will have the money available to go into these other sections that we have not been able to cover thoroughly. In other words, if we are

to fix the grades on a just basis in the spring-wheat area, we o do a little more work on that spring-wheat section, which more economically done from a point in that section than shington, saving the traveling expenses and getting in closer with conditions.

CHAIRMAN. How many have you now?

DUVEL. Eight. One at Chicago; 1 at Decatur; 1 at Kansas 1 at Fargo, N. Dak.—that is the milling and baking work we cooperation with the North Dakota Experiment Station—1 at nd, Oreg.; 1 at New Orleans, La.; and 1 at Washington.

CHAIRMAN. That is seven. How about Baltimore?

DUVEL. And one at Baltimore.

CHAIRMAN. Where would you propose to establish these three, eneral way?

DUVEL. Our idea was to establish one at Minneapolis, that being ing-wheat section and the largest spring-wheat market we n the United States.

CHAIRMAN. How far would that be from the ones you already here?

DUVEL. Chicago and Fargo are the nearest stations. At Fargo ve the milling and baking end of our work, and we do not opportunity to study the grain as it is going into the market.

CHAIRMAN. Your other one would be where?

DUVEL. The other one would be at Buffalo, and the third one d an idea to put at St. Louis. From the standpoint of im- ice with reference to the volume of grain received, Minneapolis second; Buffalo, third; and St. Louis, combined with East uis, fifth.

CHAIRMAN. How do you manage about these laboratories? Do nt the buildings somewhere?

DUVEL. Wherever we have a chance we go into a Federal build- d save rent; otherwise we have to rent quarters.

CHAIRMAN. You do not erect any buildings at all?

DUVEL. No, sir; we just rent.

CHAIRMAN. At one time you asked for a laboratory on the coast—in Oregon or somewhere out there. Have you one in n now?

DUVEL. Yes, sir; we have one in Portland, established a year st July. The work there is being carried on in cooperation with ate officials and grain men.

MCLAUGHLIN. I thought he mentioned Portland as a place he l to establish one of these new stations?

HAWLEY. No; he mentioned it as one where they already had a .

CHAIRMAN. You think, then, that this $25,000 will be abso- necessary to expedite the establishment of these grades for

DUVEL. That is the way we feel. We placed that down at the ninimum for those laboratories, to cover that entire field. are, of course, other important points, as for example the markets. However, we have the export situation fairly well d with one laboratory at Baltimore and one Laboratory on the

The CHAIRMAN. Would those laboratories be permanent after you established the grades?

Dr. DUVEL. After that, of course all of these laboratories would not be absolutely necessary; but, in the event of the passage of the supervision bill or some other effective grain legislation, of course laboratories would have to be maintained at these various markets to give prompt service, which would be necessary.

The CHAIRMAN. In the event, then, of the passage of the grain-grading bill, those laboratories would be all the more necessary?

Dr. DUVEL. Yes, sir; representatives of the department would have to be there on the ground.

The CHAIRMAN. Your next increase is $7,500 for investigating the handling, grading, and transportation of kafir, milo, and other grain sorghums. Until you have established your grades for wheat, oats, and barley, the principal grain crops, do you think it well to undertake very extensively the establishment of grades for these relatively minor crops?

Dr. DUVEL. It was not our idea to go into that extensively. This $7,500 for the sorghums was merely to get a start. Sorghum production has been increasing very rapidly during the last five years in sections of Kansas, Oklahoma, and Texas; it is becoming a very important crop, and they are having a great deal of difficulty in knowing how to handle, store, and ship it to best advantage. The question of exporting kafir has been a problem, and so far they have not undertaken to export any appreciable quantity because they do not know how to handle it; and, of course, it has no European demand, and will not have until it can be delivered in good condition. But we want to carry on investigations to ascertain how to handle these grains and how they can be stored so that they can go into the markets with less deterioration. For instance, we find at the present time a good deal of——

The CHAIRMAN (interposing). You think, then, that this appropriation of $7,500 is vitally important?

Dr. DUVEL. Yes, sir; I think that it is of the utmost importance to the kafir and sorghum producers and dealers. Now, as to the amount of sorghum grains, I can only say there are no definite statistics, but it is probably somewhere in the vicinity of 60,000,000 or 75,000,000 bushels this year. That is the best estimate I can make.

Mr. HAUGEN. For what is this grain used?

Dr. DUVEL. Heretofore the bulk of it has gone into poultry feed.

Mr. HAUGEN. Has any of it gone into human food?

Dr. DUVEL. Some. Some of the railroads now serve kafir-corn muffins on their trains.

The CHAIRMAN. Your next increase is $4,500 for a study of grain-handling methods in the Southern States. Of course, considerable progress has been made in the development of the grain industry in the South, but is this absolutely vital at this time?

Dr. DUVEL. There are a lot of points there that should be brought out for the benefit of the grain growers in the South. For instance, last year we made two preliminary trips in connection with our work down through that section to find out how they were handling their grain. There was a movement on foot at one time to build elevators to take care of all their crop, which we urged them to be

ow in doing, and we gave assistance in a number of cases where ıey did build elevators.

The CHAIRMAN. You are not doing any work at this time along at line?

Dr. DUVEL. No, sir; except that those questions ought to be given onsideration before the standard grades are fixed, because wheat nd oats grown in the Southern States differ from wheat and oats rown in other sections, and that data should be secured definitely nd correlated so as to avoid fixing grades that would be detrimental to their interests. Of course, they are buyers rather than ellers.

The CHAIRMAN. Could not that be accomplished by having the amples sent to the laboratory here in Washington, without any additional expense?

Dr. DUVEL. We have been doing some of that, but it is hard to get in touch with the actual conditions, and particularly so in a good many cases, and very hard to get representative samples.

The CHAIRMAN. Under this $4,500 you would probably employ one man and pay his traveling expenses?

Dr. DUVEL. That is just about what it would amount to—one man with his traveling expenses, and part of the time of an assistant here in Washington to assist him in handling the samples sent in from the field.

The CHAIRMAN. Have you made any study of those samples from the South at all?

Dr. DUVEL. Not to any extent in connection with our work.

The CHAIRMAN. Of course, all of these increases are very vital, but do you consider this extraordinarily vital?

Dr. DUVEL. We were extremely conservative in making our estimate, and that is the lowest limit. I might say we could use $50,000 there and use it to very good advantage.

Mr. HAUGEN. You say you rendered valuable assistance down South in the building of elevators. Now, will you state to the committee what assistance?

The CHAIRMAN. I think the assistance was in putting up the proper building.

Dr. DUVEL. It was in assisting them to put up the proper building. One of our men, who is a practical man, went into the South ınd conferred with those who contemplated building elevators, made ı study of the kind of grain within such sections, the quality of the grain there, the estimated amount of this year's crop, and the possibility of an extension of the grain acreage; and he advised prospective builders as to the size of the house that they could put up vith safety. For example, in one case they were going to put up 150,000-bushel house. But after going over that matter and discussing the situation fully with our expert, the capacity of the ıouse finally built was reduced to about 70,000 bushels. But, even hen, I believe they built a larger house than necessary. Their idea ;as in the beginning to buy the grain from the farmer as harvested, nd store it and resell it the following spring, which is impossible ı that section on account of the weevil.

Mr. HAUGEN. Is not that largely a business question in the South?)o they not take those matters into consideration?

[illegible] those matters into consideration, [illegible] that we went down.

Mr. [illegible] understand that those men in the South [illegible] with a capacity for 150,000 bushels with [illegible]

[illegible] idea. They do not know exactly how [illegible] having had any experience with grain. [illegible] in the building of elevators, and [illegible] additional bin space could be added, [illegible] large house which would be useless to them in case it proved to be impracticable. Another thing to consider is whether they are going to continue growing grain or revert to the growing [illegible]

Mr. Haugen. Then are we to understand that the department is carrying on a sort of a primary school, teaching addition, multiplication, and division? Is that the idea?

Dr. Duvel. No, sir. That is just one of the many things that come up in connection with the handling of grain. It is part, as we believe, of the handling investigation to give those people the instruction. We have the same thing on the Pacific coast at the present time, where there is an agitation for a transfer from the bag handling to the bulk-handling method.

Mr. Haugen. That is a matter of expense, is it not—how it can be handled more profitably?

Dr. Duvel. Yes; but they have grown up under a bag-handling system and are not familiar with the handling of grain from elevators; they do not know the capacity and they do not know how it ought to be constructed, and they want to get some information that they can know does not come from a man who has an elevator or elevator machinery to sell.

Mr. Haugen. Is not that for the warehouseman to determine for himself? Isn't it a fact that, where it is handled in small quantities, it is handled through the flat-house system, without an elevator, and is handled in sacks or in wheelbarrows?

Mr. Hawley. In the western country they do not handle it in that way, because they have the second or third largest spring wheat port in the world—Portland, Oreg.

Mr. Haugen. Still they are instructing the people out there how they should handle it.

Dr. Taylor. Mr. Chairman, may I just offer this suggestion with reference to the southern grain handling? You may recall that when cotton dropped to 7 cents a pound the southern farmers were confronted by the question of what to grow. The department, the colleges and stations, and the business men of the South suggested, in view of the situation, a reduction in their attention to cotton and an increase in their attention to the grains. The result was a larger production of the small grains in the South during the season of 1915 than has ever occurred before. The next feature was that the South, having always been dependent on shipped-in grain, was unprepared to take care of this new product. They did not know how to shock; they did not know how to thrash; they did not know how to stack or store. Under that emergency there was given to the department the question as to advice with reference to these features, which are common knowledge in the grain-growing

stions but which were vital in the months of May and June in ouisiana and the South generally.

Mr. HAUGEN. Would not that more properly come under the head- of farm management and farm supervision, and is not that ex- ly the work that is intended to be done by the States Relations rvice men?

Dr. TAYLOR. The difficulty there was that the administrative forces re essentially cotton forces. They were local and in the same sition as the farmers themselves. So the department spent a few ndred dollars in ascertaining, as nearly as possible, what the ditions were and in suggesting, in response to inquiries, how the in should be handled in the field, how it should be thrashed, and, an the question was asked, what facilities it was wise to provide the handling of it.

Mr. HAUGEN. But is it not possible to secure the services of people the field who might be able to furnish the farmer with the in- rmation as to the size of the bin required for the storage of a ousand bushels of wheat as well as 10 bales of cotton?

Dr. TAYLOR. In Louisiana——

Mr. HAUGEN. I know it can be done in the North; I supposed it uld be done in Louisiana.

Dr. TAYLOR. In the North we do not need it; but in the South, it is my judgment that, if the farmer ever needed anything from the partment, he needed information as to what he should do during he next six weeks following the middle of last April when his rvest was on.

Mr. HAUGEN. He may have been in need of your information, but it not possible for the various bureaus to cooperate and eliminate rge expenditures?

Dr. TAYLOR. That was done.

Mr. HAUGEN. And eliminate a duplication of work.

Dr. TAYLOR. Much of this work was done through instruction of the county agents and demonstration people, bringing them together where they could be informed.

Mr. HAUGEN. And the services paid for by your bureau?

Dr. TAYLOR. No, sir; our only expenditure was for the traveling expenses of our field men.

Mr. LEE. And the amount was very small?

Dr. TAYLOR. The amount was very small—something like $500.

Mr. HAUGEN. In the estimates of the amounts referred to by the chairman, I take it that that was in anticipation of the passage of the supervision bill?

Dr. TAYLOR. Yes, sir.

Mr. HAUGEN. In view of the progress made in the passage of the bill, would it not be a matter of good policy to provide for appropria- ion for the work in the bill when we pass the bill, and not to go on nd make these appropriations in advance, especially with the uncer- ainty of passing the bill?

Dr. TAYLOR. If it can be put in the bill, of course, it should be put here; but the present appropriation bill does not cover it.

Mr. HAUGEN. Would not that be the proper place for it to go? take it that this whole work would be of no value—it may be of ome value, but of very little value—unless the bill gives the depart-

ment authority to establish standards and gives it supervision ove them.

All this work has been done anticipating the passage of the bill

Dr. TAYLOR. While it has been done in anticipation of the passa of the bill, we believe it is of sufficient importance to be continue even though we never have a supervision bill.

Mr. HAUGEN. You may think so; but we think the expenditure o a million dollars is of some importance, also, and we ought to hav some results from it. And if we appropriate money for certain pu poses, it ought to be for a purpose that could be made use of. I a not criticizing the work that is being done, but there are a goo many other important things to be considered by this committee.

Dr. DUVEL. For myself, I look at this whole problem in this wa Here we have various grain crops having a value far greater tha all other agricultural products, and the amount of money bein spent on them for methods of handling, storing, and transportin and various features in connection with this particular work an also in connection with the cereal breeding work, is in reality very, very small percentage.

Mr. HAUGEN. I agree with you as to the importance of the cro and I regret very much to see that very little attention is given these important crops in studying diseases attacking them. I tal it that a study of the diseases of corn and wheat—black rust, etc. is of infinitely more importance than this is, unless we pass t supervision bill. Of course, if we pass that bill, which I believe of great importance, then this must necessarily go with it. Co gress ought to authorize the Secretary to fix the standards and apply those standards; unless that is done this work is of but sm importance compared with studying the diseases of the plants, an if we have any surplus money—and my understanding is that t Treasury has no great surplus at the present time—we might po sibly spend some of that money for some other purposes of great value.

The CHAIRMAN. Dr. Duvel, this is your baby, and you are n going to say it is a bad boy, are you? [Laughter.]

Dr. DUVEL. No.

The CHAIRMAN. We are very much obliged to you.

(Thereupon, at 1 o'clock p. m., a recess was taken until 3 o'clo p. m.)

AFTER RECESS.

(The committee reassembled at 3 o'clock p. m., and immediat took a recess till 10 o'clock a. m., Tuesday, January 25, 1916.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Tuesday, January 25, 1916.

ıe committee met at 10 o'clock a. m., Hon. Asbury F. Lever irman) presiding.

TEMENT OF DR. L. J. BRIGGS, BIOPHYSICIST IN CHARGE BIOPHYSICAL INVESTIGATIONS, BUREAU OF PLANT DUSTRY.

ıe CHAIRMAN. Dr. Taylor, we will take up this morning item 84, r biophysical investigations in connection with the various lines ork herein authorized, $32,500," an increase of $7,500.

r. TAYLOR. This item, Mr. Chairman, is one under which a line ry important technical work in connection with the determina- in particular of the moisture requirements of plants is conducted, work having largely to do with the conditions that prevail in the portions of the country. Heretofore it has been practically icted to work under dry-farming conditions. It has become asingly apparent that work of this type is required in connection irrigation agriculture before it will be possible to accurately rmine the duty of water in irrigation agriculture. The increase ,500, as indicated in the note, is intended to be used particularly he extension of this work to irrigation agriculture, especially ı three of the Government reclamation projects. Dr. Briggs the whole matter in hand and can discuss it.

ıe CHAIRMAN. Before Dr. Briggs starts, is there not some other uage that would express this more fully? To the layman physical" does not mean anything. I do not think anyone on ı would connect biophysical with water-requirement studies and farming.

r. TAYLOR. This is back of and underneath dry farming. It is hysics of life, in so far as plant life is concerned under those con- ns. I think, perhaps, Mr. Chairman, it will help us for Dr. gs to briefly indicate some of the things that he is doing. I think nswer to your question perhaps will come through a presentation me of those activities.

ıe CHAIRMAN. All right. Dr. Briggs, will you please make your ment just as brief as you can to be comprehensive.

r. BRIGGS. Mr. Chairman and gentlemen, the fundamental idea in farming is, of course, to make the most efficient use of the limited all. Now, that means, on the one hand, getting as much of this all as possible into the soil, and, on the other hand, using those which will make the best use of the rainfall. As far as the first

HELGESEN. Well, not per ton, but for a fair crop, because that standable by anybody.
CHAIRMAN. Yes, that is better. I wish you would do that. statement referred to follows:)

showing the number of acre-inches of water required to produce a ton of dry (grain and straw combined) at Akron, Colo., for the more important crops.

Crop.	Acre-inches of water required to produce 1 ton of dry matter.
	2.6
	2.7
	3.1
	4.4
	4.5
	5.1
	7.1

since a ton of grain would require approximately twice as much water as for straw combined. A 30-bushel wheat crop or a 50-bushel oat crop would about 8 acre-inches of water. These figures refer only to the water passing the plant and do not include the evaporation from the soil. The water ent is less in the northern part of the Great Plains and higher in the southern

STEELE. Do the State agricultural colleges work out this same n of dry farming?
BRIGGS. No. As far as this water-requirement work is con- it is being done only at one station and that is in Nebraska, hey are investigating the water requirement of corn.
STEELE. I am interested in South Dakota. At the Brookings they have an experimental station and up at Harrold, I they are working on these problems with the appropriation of vernment to the States, and that is one of the arid regions of st.
BRIGGS. They are not working on this question of the water ment of plants.
STEELE. We have demonstrated for 25 or 30 years that if you ot got any water you will not get anything, but if you have ou will get a big crop. This year we had a big crop. I have a down there that I have spent a great deal of money on aenting with various crops. Mr. Hansen has been experi- g with alfalfa and, I believe, he is going to make a success. I ready 32 acres in it. He gave me 50 plants and they grew so the dry years that it encouraged me so that I got some more, expect to get 80 this year. The question with us is that if not get any moisture you do not have any crops. I some- hink that these experiments are not doing as much good as ght to do.
HELGESEN. But, Mr. Steele, there is a very large area in the States that has some rain, and the people want to know how ain is necessary to make it possible for them to go in there e, and unless we get these facts from some reliable source they going in there and spending all they have and then have to ut.

Mr. STEELE. I was wondering why has not the Government invaded South Dakota and experimented there along these lines when they have got some of the finest experiment stations in the country.

Mr. WILSON. You think they ought to cooperate with the States?

Mr. STEELE. Yes.

The CHAIRMAN. Doctor, wherever the State is doing any work and you go into that State, you work along with them cooperatively?

Dr. BRIGGS. That is handled by the Office of Dry-Land Agriculture, which works in cooperation with the different States.

Now, a very important point in this connection is that different varieties of the same crop do not have the same water requirements. Some are much more efficient than others. So that it is highly desirable to determine which variety is most efficient, because the more efficient the variety we use the better the chances are in a dry year to get a return that will offset the expense, at least.

Mr. HAWLEY. And those are climatically all equally well adapted?

Dr. BRIGGS. I think they are for the middle part of the Great Plains, but wheat does not do so well in the South and millet and sorghum do not do so well in the North. These experiments were conducted at a station midway, where they all do well. Here [exhibiting] is a photograph showing experiments on the water requirement of cotton. That was carried on here at the Arlington Farm.

Mr. WILSON. Do you use different amounts of moisture in each one of these?

Dr. BRIGGS. No, sir; we use six pots of each variety simply to multiplicate the experiment, in order to reduce the experimental error.

The next project deals with special biophysical investigations

Mr. HAWLEY. Before you pass on to that, how do you get the information that is derived from the investigations under the preceding item to those who are planning to go there and run a farm?

Dr. BRIGGS. That is done through the departmental bulletins and through the extension work of the various stations.

Mr. HAWLEY. You cooperate with the various stations?

Dr. BRIGGS. Yes, sir.

It is highly important, of course, not to slow up the movement of grain in transportation, so that, if the moisture content is used in grading the grain that is passing through a port, it is necessary to make those determinations rapidly. Dr. Duvel has already developed a method which cuts down the time from 36 hours to about half an hour. With this instrument the moisture can be determined still more rapidly. The method depends simply upon the fact that the electrical resistence of grain varies greatly according to the amount of moisture in the grain. Here is the apparatus for measuring the electrical resistance.

The reading of the instrument is 80 for this particular sample of grain. Going into the chart with this reading, we find that the moisture content is 12¼ per cent. Of course the measurement could be made more quickly than I have done it.

The CHAIRMAN. Has that instrument been adopted by the commercial world or by the trade?

Dr. BRIGGS. No, sir; it has just been recently completed by the office.

Mr HAWLEY. You are confident of its accuracy?

Dr. BRIGGS. We have made hundreds of determinations in cooperation with Dr. Duvel's office. The instrument is accurate to a quarter of a per cent or better in the case of wheat and corn.

The CHAIRMAN. Is that patented in the United States?

Dr. BRIGGS. It will be.

The next subitem under this project concerns the work of the office in connection with a serious trouble of orange and lemon trees in southern California. It is simply representative of one of a number of troubles that occur among tree crops or perennial crops in irrigated regions. This trouble is known as mottle leaf.

Mr. LEE. Is that similar to the citrus canker of Florida?

Dr. BRIGGS. No, sir. There is no connection. It is characterized by the disappearance of the chlorophyll and the appearance of yellow spots on the leaves. As the trouble advances there is a serious decline in number, quality, and size of the fruit. We have made a rather extensive examination of the affected area, and the result is that in half of the instances we can fully account for the mottle-leaf on the basis of the very low humus content of the soil, so that the remedy is to increase the amount of organic matter that is being applied to the soil. Here is a photograph which will show the result of such treatment after three months' standing. In this case the treatment is also combined with an improved method of irrigation. We are using what is termed "a mulched basin system of irrigation." That is, a basin is thrown around each tree and each basin is covered with a heavy mulch of manure or alfalfa. The trees are irrigated by filling the basin with water. This wets the mulch thoroughly, and the water in soaking down past the tree roots carries with it the valuable part of the manure to the roots of the tree. Furthermore, it prevents the formation of plowsole, a condition which is very harmful to the trees. This treatment has resulted in a very marked improvement in the trees. One experimental tract which we have had under observation for two years has this year two and one-half times as much fruit on the treated trees as on the untreated trees.

The last item on this project deals with some experiments which the department has been making of the effect of the use of electricity on the growth of crops. That is a subject of great interest in the country, apparently. We get hundreds of letters regarding it. I think we have been able to save the people of the country from unwise investment along that line, because the results of our experiments have shown that with the methods which we have employed, at least, there has been no substantial increase in the growth of crops as a result of the electrical treatment—certainly nothing justifying the expense of the equipment.

The CHAIRMAN. Do you mean to say that a great many concerns are advertising an instrument claiming that it will bring results?

Dr. BRIGGS. Not a great many, but some firms are advertising it abroad, and we have advised the farmers that the subject has not reached a practical stage, according to our experiments.

Mr. STEELE. Doctor, I can see that this is a benefit. Do you make a survey of the people who have these groves and who would be benefited by this knowledge, and do you have a report from all the growers and then send out your bulletins to them?

Dr. BRIGGS. Yes; we reach those men through the citrus exchanges, which are thoroughly in touch with the growers.

The CHAIRMAN. Is there any further statement you have to make, Doctor?

Dr. BRIGGS. I would like to say a word about the increase requested.

The CHAIRMAN. Yes; if you please.

Dr. BRIGGS. Practically every irrigation project throughout the country shows the use of an excessive amount of water. In other words, you will find some places on the lower part of the project where the land has become seepy and is covered with alkali, due to the fact that the water has moved down on to the lower part of the land from the upper part of the project. Now, it is possible by means such as I have indicated here to determine with a fair degree of accuracy the water required by the different crops under climatic conditions prevailing at these various projects, and with that knowledge carried into the field and checked by suitable moisture determinations in actual growing crops on the project, it will be possible for us to determine what is a reasonable amount of water to be applied to these crops and when it could be most advantageously applied. That is information which is very much needed on the reclamation projects and knowledge which would result not only in a saving of water which would in turn increase the area which could be irrigated but which would protect the farmer on the lower level from having his land destroyed, through no fault of his own, and would, I believe, result in a general better understanding between the men who use the water and the men who supply it regarding the time and the rate at which the water should be distributed.

Mr. WILSON. Let me ask you a question. How long have they been dry farming now?

Dr. BRIGGS. Dry farming has been in existence in certain portions of the West that is, in the Great Plains—for 30 or 40 years. The Mormons in Utah were the first great dry farmers. They went into Utah, I think, some time in the early fifties and started irrigation there, and very shortly afterwards they started dry farming on certain of their tracts that could not be brought under the ditch.

Mr. WILSON. Has your investigation been encouraged to any great extent and is the area of dry farming much larger since you have been at it?

Dr. BRIGGS. It is steadily increasing in the West at the present time. More and more land is being taken up every year.

Mr. HAWLEY. We passed a bill through Congress not long ago making dry-farming homesteads.

Mr. WILSON. I know that.

Dr. BRIGGS. Yes; and a very wise provision of that law was the provision increasing the acreage, because, as I tried to indicate in my remarks, the success of the dry farm, in my opinion, will be found in the economic operation of a larger area rather than to practice intensive methods on a small area, on account of the uncertainty of the rainfall.

Mr. HAWLEY. You made a statement yesterday about the necessity of breaking up the ground in order to preserve the moisture or the rainfall. What was that statement?

Dr. BRIGGS. That such tillage is justified by the returns under conditions in the Great Plains only so far as it is necessary to destroy the weeds. The weeds are the great source of loss of water in the

. For instance, the ordinary pigweed uses as much water
t and sunflower uses as much water as alfalfa. If you have a
nflower on your summer fallow, you might as well be growing
ns of millet.
AWLEY. But if the land is free from weeds or any other crop,
etain the moisture without so much surface cultivation?
RIGGS. Yes, sir. In other words, the loss of water that takes
thout surface cultivation is usually less than the cost of the
cessary to maintain a surface mulch.
TEELE. Do you issue a bulletin or have you discovered in
ning that it is necessary for the farmer to leave about every
twelfth stalk standing? For instance, you know that people
p in the winter for forage. I have discovered that it is very
nt that you leave every tenth, twelfth, or fifteenth row
out the field, because this short grass grows on this dry area,
en you have snows the winds blow it and carry it across the
to the low valleys and gullies, etc. I have discovered that
ing a row in the field it catches the snow, and the snow in
ng melts down and you get good results. It seems to me
t is a thing upon which you ought to issue a bulletin to these
ners. I do not know whether you do, but I am just suggesting
comes to me in a practical way.
HAIRMAN. We are very much obliged to you, Doctor.
ELGESEN. Doctor, as a concrete example of the need for
n one of the western States where they had practiced dry
and apparently succeeded for a while they commenced to
e all over the country for settlers, and people went from
ere, and a great many from our section of the country went
e. They sold their farms and went out there because they
ed that the climate was better, only to find, in the first place,
y did not know anything about dry farming, and, in the sec-
e, they spread out over such a large area that they could not
dry farming, and finally they all went broke and came back
. I think they ought not to go out there where it is not pos-
make a success at dry farming. I do not think the Govern-
ght to let those people go where they can not carry it on
ully. I think the department would be justified in issuing
a containing that information.
HAIRMAN. It is justified, moreover, Mr. Helgesen, in a meas-
he fact that the Government encouraged these people to go
re.
ELGESEN. Well, they have advocated dry farming.
HAIRMAN. We are very much obliged to you, Doctor.

TENT OF MR. EDGAR BROWN, BOTANIST IN CHARGE SEED-TESTING LABORATORIES, BUREAU OF PLANT INDUSTRY.

HAIRMAN. Now, the next item, Dr. Taylor, is for studying ing commercial seeds, $28,700; no increase over last year. ou some one to discuss that item?
AYLOR. Yes, sir. There are certain points I would like to esented. This is the item under which our determinations

of the germinability and purity of seeds are made in cooperation with the various State experiment stations. We maintain seed-testing laboratories for that work. Under this item we also maintain inspection of the importations of forage crop seeds, provided for by what is known as the seed-importation law, through which, if the specified forage-crop seeds contain more than a specified percentage of impurities, they are excluded from entry until cleaned, or, if not cleaned, they are returned. Mr. Brown is here and can discuss such points as would be of interest to the committee.

The CHAIRMAN. All right, Mr. Brown.

Mr. BROWN. Mr. Chairman and members of the committee, the object of this work is to improve the quality of commercial seeds with especial reference to forage plant seeds and to reduce the sale of seeds that are adulterated or otherwise inadvisable for planting purposes. This work is carried on along various lines, as indicated by the projects. The first and simplest form of it is making tests of seeds for anyone who sends them to our laboratories, either here or the branch laboratories, to determine the percentage of the seed of that particular kind that will grow. This is fundamental information for the farmer, being information that the farmer can not well obtain for himself, because he is not sufficiently familiar with the quality of the seeds he is buying only once a year, and small seeds at that, to determine what their actual quality is. We find that, if a farmer asks his seedsman for samples of seed, and if the seedsman knows that the farmer is going to send them to a Government or State laboratory to have them tested, the seedsman will furnish him with good seed. Therefore, in large measure, the work of the laboratory is beneficial to the farmer in an indirect way.

The CHAIRMAN. Doctor, how many of these laboratories have you?

Mr. BROWN. We have one laboratory at Washington and five others in cooperation with the States of Oregon, California, Louisiana, Missouri, and Indiana.

The CHAIRMAN. How about these imported seeds? Do you have some laboratory at the port of entry?

Mr. BROWN. The work of the enforcement of the seed importation act is carried on through these laboratories. Now, under the second item, seed purity and vitality investigations we are studying the quality of various kinds of commercial seeds on the market from time to time and calling attention to any conditions which seem to need to be improved. I might say in connection with this project that we have found out how to definitely determine Turkestan alfalfa seed. We know that commercial Turkestan alfalfa seed is the poorest seed for general use in the United States. At the present time, or at least before the present war, Turkestan furnished the largest principal source of surplus alfalfa seed for the world's market. This seed is the cheapest on the world's market; it is little used in Europe, and therefore the United States has bought it largely. French and Italian seed is used in other European countries, while the same countries buy Turkestan seed for export and pass it on to the United States. In this bottle [exhibiting] is a sample of Turkestan alfalfa seed containing a small weed seed which gives us a positive identification of the source of the seed. This weed has not become established in the United States, so far as we know, except in one place.

ı, Johnson grass and Sudan grass are important. Sudan
ed is very similar in appearance to Johnson grass seed. We
many letters asking us how the seed of the Johnson grass can
ıguished from the seed of the Sudan grass, and we have found
m investigation how they can be distinguished. I have a
ere showing the characteristic differences between these two

HAWLEY. This summer in my district I had a great deal of
nt from growers of Sudan grass. They got samples of the
ınt out by the Government and were very well pleased with
ıs, and then they bought it commercially in the market and it
ıd Johnson grass.

BROWN. There is no trouble in telling the two apart. You
Johnson grass seed from Sudan grass seed.

HAWLEY. You are prepared to go after the people who furnish
ı grass for Sudan grass seed?

BROWN. Yes, sir; that comes up in connection with another
ur projects.

HELGESEN. Is there any penalty privided by law for substi-
of one of those seeds for another in that way?

BROWN. There is a penalty. I will take up that question in
ıoment.

HELGESEN. How many times can you cut Sudan grass in a

BROWN. I am not familiar with the agronomic end of it. That
e to be discussed by somebody else.

TAYLOR. Under our forage crop item we will have a general
ation of that phase.

BROWN. The matter of rapeseed is important. The United
ınnually imports from 1,000,000 to 3,000,000 pounds of winter
d. It is imported from Holland; but a year ago Holland placed
argo on the exportation of oil seeds, and that has resulted in an
ın of winter rapeseed. Seed under the name of rape has been
d from France, Japan, Argentina, and other countries, and
types have been brought into this country. The chart on
l shows the relative growth of some of these types which have
ought in under the name of rape. The second column shows
ape. The third shows a form of seed which has been brought
is known as turnip rape, which is simply a turnip without the
[t is a turnip top. It is of very little value as a forage plant
ed with winter rape. There has been enough of this turnip
d imported in the last year to seed forty or fifty thousand acres.

HAWLEY. You mean they are just weeds?

BROWN. I do not know about that. We presume the forage
milar to turnip tops and the seed to be of value for the oil it
s.

HELGESEN. Ought not there to be a law to prevent the impor-
of new varieties of seeds until the Department of Agriculture
t find out whether they are profitable or not?

BROWN. It has never been the policy of the Government to
t.

HELGESEN. I know; but that is not saying it ought not to be

BROWN. This seed is grown for the oil which it contains.

Mr. HELGESEN. If it has no value for the purpose for which it is sold, it is of no benefit.

Mr. BROWN. Not at all. A little over a year ago there was an importation of clover seed into this country, and here is a sample of it. In appearance it is an exact duplicate of a mixture of white and Alsike clover seed which is sold throughout the United States. It is of very little value. As soon as this seed was imported into this country, the Department called attention to it through the press and the importation of it stopped. At the present time clover seed is in great demand in this country on account of the disturbed conditions in Europe, and Italy and France are the two principal sources of clover seed. Since the first of last November about two and one-half million pounds of Italian clover seed have been imported into the United States.

Mr. HAWLEY. Of what variety?

Mr. BROWN. Red clover, we believe, but we have not had sufficient experimental evidence to prove this fully. We believe, however, that Italian red-clover seed is the poorest to use in the United States.

The CHAIRMAN. When you determine that, you make it known to the public, I suppose?

Mr. BROWN. Yes; we make it known through the News Letter and through our information service. The question of so-called hard seed has been a very important one. What is known as hard seed in clover, and the like, is seed which does not germinate readily because it does not take up water. We have been carrying on some experimental work along this line and have found out something which points very strongly to the reason why hard clover seed which is sowed very early in the spring or late in the fall will make a good crop, while clover seed which is sowed in the late spring will not give a good stand. We have found that by keeping it in a low temperature and then exposing it to a warm temperature it germinates readily. But if it has not been previously exposed to this low temperature, it does not germinate well.

Mr. HAWLEY. But how could the farmer be able to determine how low the temperature should be?

Mr. BROWN. That simply means that seeds which are naturally hard should be sowed in cold weather or in the fall when the temperature is low. This is more important in connection with sweet clover than any other of the forage plants.

Mr. HELGESEN. Could you sow sweet clover seed on the snow in any part of the country?

Mr. BROWN. I do not know exactly about that. However, it is common to sow it in the fall. It is more common, I think, to sow it in a way that it will be covered than to sow it on the snow.

Now, passing to the next project, adulterated-seed investigations, we have a special provision for collecting seeds throughout the United States through agents of the Department of Agriculture, examining and analyzing these seeds, and publishing the analyses of those found to be adulterated, together with the names and addresses of the dealers who sold them. We find this is a most important deterrent to the selling of adulterated seeds, because the seed men do not like this advertising. We also find that the seed trade is endeavoring to overcome this tendency to sell adulterated

because they ask us to let the sons of the firm or the younger
ers of the firm come into the laboratory and experiment with
that they will not be caught again next year. During the
ar we collected sweet clover seed and found that it is being
rated with alfalfa seed. A few years ago this same mixture
ld as alfalfa. Last year the price of sweet clover seed was
imately twice as high as that of alfalfa, this being the reason
was sold as sweet clover rather than as alfalfa last year.
investigated the adulteration of redtop last year, when the
f redtop was unusually high—so high that there was approxi-
a profit of 20 or 25 cents a pound for every pound of timothy
as sold as redtop. We found that 100 samples of adulterated
contained an average of 12 per cent of timothy seed, for
the farmer was paying an exorbitant price. The seed impor-
act prohibits the entry into the United States of certain seeds
they contain more than 3 per cent of weed seed, a certain
t of dodder, or are adulterated. The effect of this act has been
p out of this country practically all of the low-grade, weedy
and alfalfa which used to come in. It was not unusual several
go for large shipments of this worthless seed to come into this
y, but that is not the case now. We have a publication of a
ars ago which shows that much of it came in with only 43 per
good seed.

HAWLEY. Is it possible to take all the dodder out of clover

BROWN. I do not think it is commercially possible to take all
dder out of clover seed. It is possible to take most of it out
me kinds. For instance, it is possible to do it where the
seed is smaller than the average clover or alfalfa seed in
it is found. The Chilean dodder is approximately the same
the clover, and it is practically impossible to remove it.

REILLY. Is there any law punishing seedmen for selling alfalfa
top?

BROWN. There is no penalty except the provision in the Agri-
appropriation act which gives us the privilege of publishing
mes of the sellers of adulterated seeds. We have this very
al way of preventing it.

REILLY. Do you not think there ought to be some penal
attached to such acts when they deal with things in interstate
rce?

BROWN. I think we have a more practical and economical
l of doing it through the present arrangement than we would
rough any law which required the inspection of all seeds sold
state commerce.

STEELE. Have not some of the States adopted legislation in
e?

BROWN. Yes, sir; about 27 States have such laws now.

, I would like to speak of some things which are not covered
seed-importation act. During the last year there were about
00 pounds of crimson clover seed imported. This crimson
is used largely through the Middle Atlantic States, and of
000,000 pounds 2,500,000 pounds had an average germination
er cent. Half of the seed that was imported had a germina-
only 54 per cent and some shipments were entirely dead.

This means a large loss to the farmer who sows crimson clover, as it is one of the most difficult plants with which to obtain a stand in the field.

The CHAIRMAN. You have no authority under this act to hold up that kind of importation, have you?

Mr. BROWN. The act does not prohibit the importation of seed because it is dead or because it is chaff or dirt.

The CHAIRMAN. Do you regard that as a very vital defect in the law?

Mr. BROWN. Yes, sir; I do. I think it should be corrected.

The CHAIRMAN. If you send up some suggestion on that proposition I think the committee would be glad to consider it.

Mr. BROWN. A memorandum will be furnished by the department.

Mr. HAWLEY. Do you publish the facts about the dead seed?

Mr. BROWN. Yes, sir.

Mr. HELGESEN. You lock the door after the horse is stolen!

Mr. BROWN. Yes, sir.

Mr. HOWELL. Is this inferior seed permitted to be sold in the country in which it is produced?

Mr. BROWN. Generally, it is not, although in most of the European countries there is no law governing the sale of seeds.

Now, I would like to call your attention to some figures on orchard grass. Over 300,000 pounds of the seed imported last year had an average purity of 31 per cent, only a portion of which would grow. Some 16,000 acres of orchard grass seeded with this seed would produce only one fifth of a normal stand.

Mr. HAWLEY. What are the impurities of that seed?

Mr. BROWN. Mostly chaff. There was one cargo of about 5,000 pounds of red clover seed brought in recently, and only about 5 per cent of it would grow; the rest was dead. Of course, we know what that means to the farmer who sowed it.

Hairy vetch is another item. We import a great part of that sowed in the United States. The seed importation act does not cover hairy vetch. There was an importation of it last year that had about 5 per cent of real hairy vetch in it, and the rest of it was weed seed which had no value.

The CHAIRMAN. We are very much obliged to you, Mr. Brown.

STATEMENT OF MR. M. A. CARLETON, CEREALIST IN CHARGE OF CEREAL INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, we will take up the next item, "For the investigation and improvement of cereals and methods of cereal production, and the study of cereal diseases, and for the investigation of the cultivation and breeding of flax for seed purposes, including a study of flax diseases, and for the investigation and improvement of broom corn and methods of broom-corn production, $147,000, an increase of $5,000 over the present appropriation.

Dr. TAYLOR. Under this appropriation, Mr. Chairman, our general breeding work with cereal plants is conducted, also our investigations of the diseases of cereals, including flax. The work is divided into two groups, one including the small grains, including flax, under the direction of Mr. Carleton, and the other covering corn, under

ction of Mr. Hartley. The increase, as explained in the note, is nded specifically for an enlargement of the work upon flax, uding the breeding of better-yielding varieties of high oil content, l including an enlargement of the work upon flax diseases. You y recall that in the subappropriation, item 88, "for testing and ding fibrous plants, including the testing of flax straw, in coopera- n with the North Dakota Agricultural College, which may be d for paper making," there was a proviso, "that $5,000 of that ount may be used in testing and breeding flax, with a view to reasing the quality and oil content of flaxseed, including rotation periments and demonstrations." It has not been found possible spare the full $5,000 from that work without seriously crippling t work. We have, however, as indicated in a note under item 86, voted $1,500 of that $5,000 to testing and breeding flax. The oposal now is to increase this item to the full amount of $5,000 for ax work in addition to what has been done under this item, leaving hat we know as the paper-plant item as it stands for the coming ar.

The CHAIRMAN. So that it will be an increase of really $3,500 for at flax work?

Dr. TAYLOR. Yes, sir. Now, Mr. Carleton will discuss the general ork along this line.

Mr. CARLETON. Mr. Chairman, in the first place, I will say that I ave here two very able associates, Mr. Ball, who is in direct charge f the grain sorghum investigations and western wheat investiga- ions, and Dr. Humphrey, who has charge of cereal diseases. After I am through I would be glad to have you ask them any questions ou desire. You notice that we have in the Program of Work, first, he wheat investigation, then the other investigations, but I will ake one brief prefatory statement that I will not have to repeat as I come to each subject. It is probably true of all of the divisions of our bureau, but perhaps more especially so with this one, that for some time we had to do a lot of pioneer work. There are no indigenous small grains in the United States. Therefore, all of the small cereal crops are based on foreign introductions, so that we have done a great deal of pioneering work in introducing the better varieties of cereals. Long after the first seed grain was brought over, it was found that there were other kinds in other parts of the world better adapted to this country than what we were growing. Hard winter wheats were established and durum wheat in the North, better oats and rye, and so on. In recent years we have shifted our work more into the line of making better varieties than in previous years. Now, we have our stocks and we are improving them. The Fife wheat was introduced many years ago, and now there are a number of varieties or strains of that wheat in the northwest. We found that some of those varieties will produce four or five more bushels an acre than the others. Then we have the diseases of these cereals to contend with, and some varieties are more resistant to these diseases than others.

Now, I can not take time to go into all these things that we have done during the last four or five years, or perhaps three years, but I want to give you one example of our work in wheat investigations—and that is the establishment of a better variety of the hard winter wheat—the Kharkov. It is better adapted to portions of the Great

[illegible] Plant. We have found that it is better than any other kind of w[illegible] in Montana. In the last year [illegible] there has been [illegible] Experiment Station, the [illegible] all over the State. That is very [illegible] done in cooperation with the Experiment Station. We do not [illegible] in the seed-selling business, but the distribution is done in some [illegible] with the States. In that way we are able to distribute the seed.

Mr. [illegible]. What do you call that?

Mr. [illegible]. It is a hard winter wheat.

Mr. [illegible]. Why don't you get an American name for it?

Mr. [illegible]. I will say that it is pretty well known [illegible]

Mr. [illegible]. Is that variety of wheat grown in any of the [illegible] or Oregon?

Mr. [illegible]. It does not do well in North Dakota. I [illegible] some places in South Dakota and Montana. It is [illegible] that we find it adapted. In Montana, it has [illegible] [illegible] a line of demarcation between spring and winter wheat [illegible] spring wheat will be grown in a certain district in the [illegible] and winter wheat will be grown in the more southern part of the [illegible]. That we [illegible] some other varieties of wheat—for instance, the [illegible] [illegible] and some of the other varieties of [illegible] [illegible] that do well for winter [illegible] the winter is not very cold there. We have been [illegible] [illegible] good varieties there, especially the Chul and the [illegible] [illegible] the Department of Agriculture introduces [illegible] of wheat, and we have got seed, so that in [illegible] [illegible] we are getting pure seed [illegible]

[illegible] with the work in cereal diseases a great deal is [illegible] [illegible] that are resistant to rust, [illegible] [illegible] by crossing.

[illegible] a similar kind of work is going on, [illegible] I will call your attention to the fact that the Sw[illegible] was introduced some years ago and is now growing [illegible] of bushels. In Wisconsin it has been found [illegible] a year to the oat crop of that State.

Mr. [illegible]. That is a 10 per cent dividend on the entir[illegible] of the Agricultural Department.

Mr. CARLETON. It is about that amount. I neglected to m[illegible] the fact of the introduction of durum wheat, which is prett[illegible] known now. The value of that crop is something like $40,000[illegible] year. An interesting thing about it is that a large part of it is [illegible] in a section of the country which has not been generally used for [illegible] production. For awhile that wheat was not well received, but [illegible] the last two or three years it even sold at a premium.

Mr. YOUNG. Doctor, will this Swedish Select oat grow well [illegible] parts of the country?

Mr. CARLETON. It will not do well in the South at all. The [illegible] tory in which it will do well is about from eastern Montana t[illegible] York and southward to northern Iowa. In the meantime, ther[illegible] also introduced a new variety of oats, known as the Kherson oat [illegible] the Province of Podolia, in Russia. That was introduced int[illegible] Iowa at the same time the Department of Agriculture intro[illegible]

Sixty Day oat, which is found to be practically the same thing, far as you can see any difference. There is practically no difference appearance. As a matter of fact, however, the Kherson is adapted the more northern sections of the country. Both the Kherson d the Sixty Day oats are yellow oats. They are very early and ey have revolutionized the oat industry in the central part of the untry. At the same time, the farmer did not like the yellow oats. he horses may not know the difference, but the people want white our and say also that sometimes the horses will not take the yellow ats after they get used to the white oats. Anyway, the yellow oats re not very well liked, and they bring a somewhat smaller price. In the last year we have produced at Ames, Iowa, two or three different rains of this oat that are white in color and give a little better yield han the Kherson. They are now being introduced into Iowa and ther parts of the country.

The CHAIRMAN. Why is it called Sixty Day oats?

Mr. CARLETON. It is supposed to ripen in 60 days, but, as a matter f fact, it does not ripen until about 90 days.

Mr. REILLY. What advantage has the Sixty Day oat over the other inds of oats?

Mr. CARLETON. Ordinarily it has an advantage, because it ripens arly, and there are so many things that come on in the summer that ttack the crops—for instance, great heat or unusual humidity. It is probably the earliness which causes it to yield better than other varieties if it is adapted to the locality.

Mr. REILLY. What is the usual time for the maturing of ordinary oats?

Mr. CARLETON. Somewhere near 100 days; but these will mature about a week or ten days—say, about a week—earlier than the other oats, usually. We have worked, together with Dr. Humphrey, in cereal diseases to bring up a variety which will be immune, or at least resistant to disease. It is interesting to note that the Burt oat is immune to smut. That is somewhat in the same class as the Kherson or Sixty Day oat as to earliness, but in other respects they are entirely different. I do not know of any case where I have seen smut on Burt oats. We have made some crosses of Burt oats with Kherson and Sixty Day oats in order to get a new smut-resistant variety. Although smut can be prevented, the farmers are very careless about using the proper treatment to prevent smut.

The CHAIRMAN. What is the treatment, Doctor?

Mr. CARLETON. The method is to treat the seed with either hot water or formaldehyde.

The CHAIRMAN. It is a simple treatment.

Mr. CARLETON. Yes, sir; it is inexpensive. Formaldehyde does not cost very much.

Mr. HAWLEY. We used to use blue vitriol.

Mr. CARLETON. Yes, sir; that is used a great deal, but the chief reasons for not using copper sulphate is that experiments here and in Germany in recent years show that where the thrashing machine crushes the kernel the copper sulphate gets into the kernel and injures it, but hot water will not do that; hot water will not hurt it at all.

Mr. HAWLEY. What is the temperature of the hot water that you apply to the seed?

Mr. CARLETON. About 135° F. A thing that makes it difficult for the farmer to use the hot water treatment is that you have to have a pretty good thermometer to register the temperature accurately, and a temperature a little too high may injure the seed, and if too low it is ineffective.

Mr. REILLY. Have you found any variety of oats that will resist rust?

Mr. CARLETON. No, there is no variety of oats that will resist rust to amount to anything.

Mr. HEFLIN. They have an oat called the Texas Rustproof oat.

Mr. CARLETON. Yes, sir.

Mr. HEFLIN. The rust does not injure it?

Mr. CARLETON. There is another case of the erroneous use of a name. However, it does resist rust to a certain extent in the South. It is a curious thing that Rustproof oats will resist rust in the South but not in Illinois. There is another variety of oat called the Early Ripe, which is said to be immune from smut, but recently we have found that it is the same as the Burt.

The CHAIRMAN. How about your barley investigations?

Mr. CARLETON. In the barley work one or two things stand out above the others. We have an excellent scientific worker and one who has done valuable work in determining just what characters can be used in breeding the crop. It is a tremendous help to other workers in the United States to show them what to do. In other words, a man can work at random, making crosses and thinking he knows what he is doing and thinking he has accomplished something when he has not, because he does not know what characters to emphasize and does not know how they will mix or how they can be improved. This investigator, Dr. Harlan, has also been working very extensively on barley for malt, and a bulletin has been published in that regard dealing with the enzyms which occur in the process of malting when the starch is converted into sugar.

Now, just one other item. A few years ago there was introduced from Syria the Smyrna White barley and the Smyrna Black barley. The Smyrna Black has done so little good that it has practically gone out of use, but the Smyrna White is now largely used in Montana and the West. About 800 bushels were distributed to the farmers last year, and the year before about 700 bushels, from the Judith Basin Experiment Station.

The CHAIRMAN. What are you doing with your rice investigations?

Mr. CARLETON. The rice work, as the committee already knows, has until recently been carried on chiefly at Crowley, La. We have had some little cooperation in Texas and have at least given information and studied the conditions in the country throughout the Carolinas, but the chief work in the South has been in Louisiana, where we are working in cooperation with the State. There is one interesting thing about that, and I think it is perhaps the most important, though I would not be positive. There has been a great deal of trouble, as the chairman and some of the members of the committee know very well, in all the rice-growing sections of the South about red rice. In the first place, red rice is not understood. It is simply an ordinary variety of rice like any other kind of rice and is not a deterioration from any other kind of rice. The point is how to get rid of it. There has been a good deal of work on it in the States,

we have worked on it for some time and have found that by a proper rotation of crops we can get rid of it. At Crowley, La., we have what is called a farmers' field day, when the farmers are supposed to come on a certain day and look over the work in a body, though, of course, there is nothing to prevent them from coming on other days if they want to. We have been able to demonstrate to them for the past year or two that red rice can be eradicated. Heretofore it has been thought that it could not be done. With the exercise of ordinary care in other respects, it is simply a matter of proper rotation of crops.

Now, since 1912 rice has been, I should say, practically established in California as a new industry. I hesitated to say established because, while all right so far as the adaptation of it is concerned, there is danger of losing the crop in California because of the water grass, and it takes good hard patient work to get rid of that grass. With that difficulty overcome, rice is now an established crop in California. The first commercial crop was grown in 1912. Before that there had been a little of it grown. Then we established a station at Biggs, Cal., and, in cooperation with the Sacramento Valley Grain Association, introduced the crop into California. In the past four years the crop has increased until last year there were 34,000 acres of land put to rice, which will give the rice growers of the State $2,000,000.

The CHAIRMAN. That is another dividend to the farmers.

Mr. CARLETON. Yes, sir.

The CHAIRMAN. Take up the item of grain sorghum.

Mr. CARLETON. This is a crop that has been given some very thorough attention for a number of years and, like some of the others, we had to begin at the foundation. We had at first no grain sorghums. The investigations have been done by Mr. Ball. About eight bulletins have been prepared by him and one or two in collaboration with other men. Of course if there are any details that you want to know about you can ask him.

One of the chief things has been the development of dwarf forms that will do better in the Southwest than the ordinary form. That is also true of broom corn. For example, the dwarf milo and the dwarf kafir are better than the ordinary kinds, because there is not so much required to support the stalk and there is a more economical production of seed.

Then a great deal of work has been done in row spacing—getting the proper spacing of the rows in the crops—because where there is little moisture you can not support as many stalks on an acre as you can where there is more rainfall. The use of sorghum has been gone into already. It was mentioned the other day that sorghum cakes are being served on the Rock Island Railroad, and I have eaten some of them myself, but I believe that some people do not like them.

Mr. DOOLITTLE. Do you like them?

Mr. CARLETON. I believe I would rather have corn cakes.

Mr. HELGESEN. How about the sorghum statistics in Kansas?

Mr. CARLETON. I do not know positively about that. The point was brought up the other day about the acreage value statistics. Mr. Ball tells me that last year there were about 30,000,000 bushels grown in Kansas, but that is the only State where we have statistics available. Heretofore the stover has been included with the grain.

I might say that the acre value of the stover and grain togeth amount to more than that of the corn crop without stover for t entire State. That does not compare with the total corn gathere that is a comparison without the fodder.

Mr. HAWLEY. The sorghum grows on land that will not produ corn?

Mr. CARLETON. Yes, sir; the sorghums will grow in land that w not produce corn.

Mr. HELGESEN. What is the market value of that crop?

Mr. CARLETON. I am talking about the acre value, not the yield

Mr. HELGESEN. I mean the entire crop that was produced—30,000,000 bushels that were produced last year.

Mr. CARLETON. The total value for the entire country is somewh around $40,000,000 annually at the present time. The seed p duction and prices fluctuate.

Mr. HAWLEY. Between what prices does it vary?

Mr. CARLETON. Twenty-five cents to a dollar.

Mr. HAWLEY. That is a wide variance.

Mr. HOWELL. What conditions are favorable to its production growth?

Mr. CARLETON. It is adapted to the lands farther west than co to the semiarid lands. It does not do well in humid areas.

Mr. HOWELL. Has it ever been introduced into the Great Ba

Mr. CARLETON. Not very much.

Mr. STEELE. It does pretty well in South Dakota.

Mr. CARLETON. The kaoliangs do very well in South Dakota. T come from China.

Mr. STEELE. That is a very good crop.

Mr. CARLETON. An interesting feature about the grain sorgh is that they are a crop adapted to the warm districts. But rec we have introduced from China a new crop which I have mentio known as the kaoliangs, and these have been making much pro in South Dakota. I have taken the State of Kansas in giving production, because we have no statistics from the other St but, if you take the other States on that basis, there is probably a production of somewhere near 100,000,000 bushels in the U States, which is about one-seventh or one-eighth of the wheat of the country, and yet some years ago there was scarcely any.

The CHAIRMAN. Did the Department of Agriculture intro sorghum into this country?

Mr. CARLETON. No, sir; not originally.

Mr. HELGESEN. Add that to your dividends, Mr. Chairman.

The CHAIRMAN. I am sorry I can not. Now, take up your investigations if you are through with your sorghums.

Mr. CARLETON. I do not know exactly where to begin on the tion of flax. The department has not done very much work on seed investigations. Heretofore it has been a matter of study of under Mr. Dewey, but for two or three years we have had the sum of $2,500 for work on flaxseed.

I might say as a prelude to the matter of the increase in appro tion for that purpose that there are two things that make it important to study flax. First, from a commercial standpoint is the tremendous demand for flaxseed for which the supply ap to be less and less sufficient each year. I have been told late

ıe men who are interested in the matter commercially that at the sent time flaxseed importation from Argentina is practically an ossibility, although we get from Argentina a very large proportion the flaxseed imported from foreign countries. Of course, the ping is in very bad shape. Everything is carried by sailboats, the freight rates are exorbitant, so that things are practically standstill in the matter of getting flaxseed from Argentina.

Ir. STEELE. Is not that due to the decrease in the production of seed in this country?

Ir. CARLETON. I am coming to that. I am speaking now of the iculty of getting flaxseed into this country. We have not enough upply ourselves and we have got to draw on foreign countries for seed. Then, the war conditions have made it very difficult to oil cake into foreign countries, and when oil cake goes down the e of linseed oil goes up. Flaxseed is now $2.20 or $2.25 a bushel, ugh it has before been as low as $1.50.

Ir. HELGESEN. It has been away below a dollar sometimes.

Ir. CARLETON. Yes, sir; on some occasions. That is one of the portant reasons for studying flaxseed conditions and the flaxseed ustry. There have been very many difficulties coming up in the of flaxseed production but chiefly three. One is that it has been supposition that flax would only do well on new land, and on that und the tendency has been in North Dakota and Montana and er near-by districts always to put flax on new ground. After one two years growth of flax it is thought that the ground is no longer e to produce flax. Now, we have determined from investigations ady made that that is not true. Flax ought to grow on old land t as well as on new land. It is possible, however—I do not want say probable—that the flax crop is more influenced than other ps by those bad conditions which arise from growing one crop on same ground every year. Wheat will not grow very well year er year on the same ground.

Ir. STEELE. We find that by sowing old ground with flax we get or 20 bushels, and the next year we do not get a very good crop, l that makes us dodge the flax proposition. That is our experience, way.

Ir. DOOLITTLE. Is flax hard on the soil?

Ir. STEELE. Yes.

Ir. HELGESEN. Now, is it very hard on the soil? I would like to your opinion on that, Doctor.

Ir. CARLETON. I do not know, Mr. Helgesen.

Ir. HELGESEN. I was down in Minneapolis some years ago, where alked that over with the president of the Minnesota Linseed Oil . He started originally in a little town south of Minneapolis, and en I asked him as to the question of flax being hard on the soil he d that was all nonsense. He said he knew a man down there who l raised more than 20 crops of flax, and that last year he raised big a crop as he ever had raised—not successive crops, of course. ctically handled, he did not believe flax to be any more destruc- e to the soil than anything else.

Ir. CARLETON. The question raised by Mr. Helgesen is one of the eral questions that we want to solve in this work—the rotation l tillage of flax.

The CHAIRMAN. Take up the next item, for the investigati minor cereals. That seems to be related to your other inve tions. You are not making any additions to that work.

Mr. CARLETON. I just want to say enough on that point to m plain that we believe that these minor cereals are only minor—

The CHAIRMAN (interposing). In a relative sense?

Mr. CARLETON. In a relative sense, and that there is a w importance along those lines to be done; that we do not give e attention in this country to some of those crops. For instan rye crop of Russia is a very big crop, as is the rye crop of Ger This is largely due to the fact that the people eat rye, as well i it to the stock. Rye has been found well adapted in parts country, and in that connection we have introduced a very go in the Southern States, all through Georgia and the Carolinas, as Abruzzes rye

The CHAIRMAN. Did you introduce that Abruzzes rye?

Mr. CARLETON. Yes, sir; some years ago.

The CHAIRMAN. That is about the best rye we can grow country.

Mr. CARLETON. Yes, sir; in the South and as far north as C

The CHAIRMAN. Have you consulted with Mr. Coker?

Mr. CARLETON. Yes, sir; we have for some years.

Mr. YOUNG. What is the effect of rye upon the soil?

Mr. CARLETON. Rye is similar to millet in its effect on t Those questions have not yet been thoroughly settled, but r grow where other crops will not grow, and so will millet, som and in order for a crop to do any good it must get somethin the soil. Of course, if it takes out moisture or food from t which will leave the soil with less than it had before, it is only sense that I can say that such a crop would be hard on the s

Mr. DOOLITTLE. What is proso?

Mr. CARLETON. We have adopted a Russian name for tha because we have no name for it in this country. The ordinary that we grow is very different from proso, which is sometime broom-corn millet. These millets have a very large seed, al large as the broom-corn seed, though the plant grows to ab size of the ordinary millet and the heads branch—that is, t panicles. In Russia, where there is much more of that grain than anywhere else, it is called proso, and we adopted that We have done considerable work in that connection which, I has resulted in great help to the farmers in the northern Great and in Montana and Idaho—say the northern Great Plains northern Basin States. I was on a farm in North Dakota there were 300 acres of proso millet, and the man was feedin of it to his sheep. I have not gone into the details of its v sheep food, but that is what he was doing.

Mr. HAWLEY. What results do you expect to get from this h zation of rye and wheat?

Mr. CARLETON. I would say, Mr. Hawley, that, so far as see now, the hybrids from rye and wheat are not very well and are of scientific interest. I can not say at this moment th would be of any economic use.

Mr. HAWLEY. You are trying to find out?

. CARLETON. Yes; trying to find out. It is a subject that has investigated for a long time. There have been several hybrids , but they have always proven sterile. Dr. Leighty is doing work, and he is a thoroughgoing scientist and does excellent ific work. That as well as other things that are being done ave been done by the department are often of scientific benefit, casionally we get excellent experience from these crosaings.

CHAIRMAN. The next item seems to contemplate one character tions for the humid area and another character of stations for id area. I presume it is at these stations that you conduct your ments?

CARLETON. I will pass around to the members this map showing hat is meant by a semiarid area and a humid area. It has been , I think, by all the workers in the Department of Agriculture ve have those two relative distinctions in the territory of the d States. I am inclined to think that we ought to have three ons—the humid area, the Great Plains area, and the western roper—but most of our work divides it into two areas, the humid xtending to about the ninety-sixth meridian. Of course you ot make an exact division, but it would run approximately to nety-sixth meridian, as you see on that map. Now, the sta- have been divided as a matter of convenience. We have sta- n the western or semiarid area and in the eastern or humid area. lack on this map indicates the stations where we are doing l cereal work.

DOOLITTLE. Is that an arbitrary division?

CARLETON. As to accuracy, it is arbitrary, but it is based on l conditions. The black shows where we are doing general work. The red shows where we have also cereal-disease work. lue shows where we are conducting rice experiments only, gh you will find some red with blue, and that means both. range shows where the flax experiments are conducted, and een shows where the broom-corn experiments are conducted. ward, Okla., is the station where we are studying broom corn. rse, we do not have control of these experiment stations except, tance, the one at Amarillo, which is a station of the Office of Investigation. Sometimes the work is done in cooperation he Office of Dry-Land Agriculture, sometimes it is done in ation with the State, and sometimes with both.

ll just call your attention to one other thing. You will notice certain sum of money is given which is used in conducting investigations, and then we have a certain sum of money is used for wheat, oats, etc. It is almost impossible to draw e as to how much work is done on oats at Amarillo, so that s a good deal of overlapping, and where we put down a certain t for wheat it can not be accurate; it may be a great deal more hat, because it is merged at these different stations with the l station expenses.

HELGESEN. The trouble that we have in the production of a pathological question; that is, it is a disease more than any- else in our State. We have no pathologists at our experiment . For some reason there seems to be a friction between the ltural college and the experiment station. We have in our

State one of the most eminent pathologists in the country, who discovered the flax disease which is threatening to wipe out the flax industry, and I would like to know how you would divide this fund so as to give a part of the fund to the man who is to deal with that question.

Mr. CARLETON. That comes under the matter of increase for flax work. Dr. Taylor stated the essential features. We have both the cereal-disease investigation and the general breeding work in the bureau, and in this case it would be our idea to divide the funds expended, half for pathological work and half for breeding work.

Mr. HELGESEN. Prof. Bolley's work has been of such importance both to the State and to the oil crushers that the oil mills have voluntarily contributed funds to his work, but that is gradually falling off because they have not had the organization that they used to have, and his hands are being tied. For the benefit of the committee, I will say that North Dakota raises approximately one-half of all the flax raised in the United States, and the flax crop is being reduced all the time, very largely because of this disease—to such an extent that flax seed has gone up from $1.50 to $2 a bushel. Now, the Standard Oil Co., as I understand it, has made experiments that have cost them nearly half a million dollars to find a substitute for linseed oil, but they have never been able to do it. Every man in the United States that paints anything is interested in the price of linseed oil, because I do not believe there is any substitute which can be produced. It is vitally important that we should save that crop to the country, and yet, unless we can find a remedy for the disease which has afflicted the flax in our State, the industry will be entirely wiped out. You say you are dividing this money half and half. Now, would any of this money go to Prof. Bolley so that he could use it himself?

Mr. CARLETON. The work would be in direct cooperation with Prof. Bolley.

Mr. HELGESEN. Yes; but if you use all the money here and merely exchange letters with Prof. Bolley, I suppose you would call that cooperation?

Mr. CARLETON. As in case of all our work at the State experiment stations, this work will be in cooperation with Prof. Bolley.

Mr. HELGESEN. But would he get any of that money to spend in North Dakota?

Mr. CARLETON. The details would be arranged between himself and us.

Dr. TAYLOR. Perhaps I could throw a little light on the matter as to how the money is expended at the North Dakota Experiment Station. An assistant, jointly agreeable to the experiment station and the Bureau of Plant Industry, is employed to work in the station at Fargo and such other experiment stations as are determined upon on the subject of flax breeding. The pathological work would be handled in the same way, with a view to avoiding any possibility of duplication and to concentrate our forces in conjunction with the North Dakota people to make possible the effective carrying forward of that work, which we appreciate is of great value and which we know has been somewhat jeopardized and is at present somewhat jeopardized by the reduction of the amounts that have been available heretofore for investigations in that line of work. There is a

e to that in the explanatory note under the item, showing
it is the intention.
ARLETON. I will say, Mr. Helgesen, that it would be our idea
with Prof. Bolley an assistant to work with him in the labo-
That is, of course, a matter of detail. There would also be
l the expense of his travels.
IELGESEN. Well, outside of his assistant and his traveling
s, you would not expect to turn any money over to Dr.
o use in other ways?
ARLETON. What I have stated is the usual procedure.
IELGESEN. I know it is the usual way, but this is an excep-
ase.
ARLETON. That would depend a great deal upon our con-
with him.
HAIRMAN. As a matter of fact, you know, Doctor, that you
ot have any authority to turn Federal money over to him.
ARLETON. No; I should say not.
HAIRMAN. You could work along with him and help divide
s, but you could not turn into his hands any of this money.
IELGESEN. I notice there are a great many ways of doing
hings in some of the large appropriations, and while you
lo it technically under the open supervision of the Govern-
t the same time it is doing the things that the State would
se have to do.
HAIRMAN. I think that is practically the same thing.
ARLETON. I will say, Mr. Chairman, that I have personally
er this matter with Prof. Bolley. He has, as Mr. Helgesen
rectly says, done an immense amount of work along this line.
ds at the head of the men in the United States who work on
eases, and we have a very good understanding about the

HAIRMAN. Take up the next item.
ARLETON. I will say further that we have introduced a
of flaxes that we know will furnish a considerably larger
y of oil than at present, which is a matter of great importance.
w that at the present time 33 per cent of the flax seed is oil.
HAIRMAN. Doctor, what about rotation of cereal crops?
ARLETON. I think that can be answered very briefly. Where
ce of Cereal Investigations has been working in some State or
y where the other offices, such as the Office of Dry-Land Agri-
have been conducting experiments, of course, whatever work
e doing we do not attempt to do. In the Pacific coast region,
here is no rotation work being done except what we do our-
we are doing a good deal of work in that line; for instance, we
me work under way at Aberdeen, Idaho, and we have recently
hed a new experiment station at Lind, Wash. Altogether we
e stations, or will have five stations, in the western area where
nd rotation work is being conducted.
important result I might mention. The farmers in Oregon
tirely too late for their summer fallow. Every year they are
ul and they dally along and plow very late. Our experiments
ie gain from early plowing.
IOWELL. What is the best time to plow for summer fallow?

Mr. CARLETON. Early in April in that region, but some farmers will not plow until around the 1st of June. They are doing differently now. The farmers have learned a great deal from these field experiments.

Mr. HELGESEN. Have you any stations in the great spring wheat sections of the country?

Mr. CARLETON. Those stations were shown on this other map. You see all these stations that are shown in black are where we are doing our general experimentation in cereal work, and at all these stations Mr. Chilcott, of the Office of Dry-Land Agriculture, is carrying on special experiment work.

Mr. HELGESEN. You have nothing except in the semiarid districts in that State we have been raising crops for forty-odd years without any system at rotation or scientific knowledge of tillage. The farmers realize that they ought to do it scientifically or systematically, but they have not the knowledge as to how they ought to do it. That country raises more than one-third of all the wheat in the United States, and it seems to me that something ought to be done to aid those people in improving their present condition, because it means a loss of millions, more or less, of wheat in the country.

Mr. CARLETON. There are two stations in North Dakota—one at Williston and another at Dickinson.

Mr. HELGESEN. Both of them are in the semiarid region.

Mr. CARLETON. And another at Edgeley. Those parts on the map that are marked in orange represent places where we expect to have dry work, and that brings it down even to Fargo.

Now, there are just one or two other things that I will take up. The question of summer-fallow is one which is very much discussed and in the Great Plains it is believed by many people that there is no longer any use for summer-fallow. That is a matter which comes up, however, in connection with the work of the dry-land agriculture office. There appears to be more reason for summer-fallow in the Great Plains than west of the Great Plains. However, we have found in the western area that you can get as good results in raising wheat after peas, potatoes, and even corn at places like Nephi, Utah, and Moro, Oreg., which makes it an advantage to use those crops instead of summer-fallow. At Moro it is found that wheat will do a great deal better after peas than after fallow. Peas are a great crop there. You can turn them under if you want to, or if you sell them you can turn under the roots after harvesting the peas. There is also a practice of hogging down the peas. I will not go into detail as to how much of the gain of a hundred pounds of more of pork to the acre has been made from hogging down the peas, but the wheat crop is considerably better after the peas than after the summer-fallow.

Mr. HELGESEN. Awhile ago you spoke about fall plowing being more expensive than spring plowing. How do you figure that out?

Mr. CARLETON. I think Dr. Briggs made that statement.

Mr. HELGESEN. I can not figure that out, because if you are plowing in the spring you have not much time.

Mr. CARLETON. You would have to do something with it in the spring before seeding, so that there are more operations involved in fall plowing than in spring plowing.

Mr. HELGESEN. I do not think so.

Mr. CARLETON. Well, as I did not make the statement, I will not defend it.

Now, I will take up the disease work and just state briefly what the lines are and then, if you desire, Dr. Humphrey can continue it. We have just finished the flax discussion. I will say there that we have the flax canker and flax wilt. Flax wilt is pretty well known as to its origin. As to flax canker, nobody knows anything about it. We have practically all to learn about flax canker. In all the western part of North Dakota and all of Montana it is an important disease of flax, so that a large part of our work will be in that particular line. Flax wilt is produced by a species of fusarium. Dr. Bolley has produced several new varieties of wilt-resistant flax at Fargo. We have discovered that such varieties must be produced to suit the various localities, because sometimes when they are taken to other localities in the country they do not succeed. So that there is considerable work to be done in the line of breeding wilt-resistant varieties.

Mr. HAUGEN. It can not be overcome by treating the soil?

Mr. CARLETON. No, sir.

Mr. HELGESEN. There is no remedy so far discovered except in a resistant variety of flax.

Mr. CARLETON. That is true.

Now, just a word as to the smut of wheat. Bunt can be very readily overcome by hot-water treatment, the same as we treat smut of oats. The loose smut of wheat is somewhat different, but by prolonging the treatment that can be very largely controlled as well as the bunt. During the past year Dr. Humphrey has been working out a method with Dr. Briggs, the physicist, which will allow one to pasteurize the seed or treat it with hot water in a very much quicker and more effective way. That is an entirely new process that is being worked on now, so that I can not give you any details of it at this time.

Mr. HAUGEN. Is hot water the only treatment that you suggest?

Mr. CARLETON. No; I explained a while ago that the two methods are hot water or formaldehyde. Now, Mr. Helgesen is right about Prof. Bolley's work in North Dakota. The farmers have generally adopted his views and his advice, and there is very little trouble at all in smut treatment. In the case of smut of oats they have adopted his treatment, as also in the case of bunt of wheat. I was just now speaking of loose smut of wheat, but the loose smut of wheat is not so common.

The CHAIRMAN. I notice that you made the statement that the estimated annual preventable loss is something like $38,000,000.

Mr. CARLETON. Yes, sir. Now, the smut of sorghums is another interesting subject. The life history of the smut of sorghums has been pretty well worked out, but there is a good deal to be learned about corn smut. We have apparently much to learn about the way in which the smut fungus works in the corn plant, and you can not adopt any remedial methods unless you know how the parasite works. So far there is no remedy for it.

There are some imperfect fungi that Dr. Bolley has worked on in North Dakota and we have found after experimentation that some of these fungi that are found in the soil, when used to inoculate the grain with the disease, absolutely annihilate the entire plant. That has been done in the greenhouses, but we have not done it in the field. Sometimes you can get results in the greenhouses which you can not get in the field.

The striped barley disease and the blotch disease of the leaves of the barley, which are produced by imperfect fungi, can be controlled by the same treatment that is used for smut, and by that treatment we can save two or three hundred thousand dollars annually for the barley growers of the country.

The CHAIRMAN. Now, sir, I think you have pretty well covered the whole field. We are glad to have Dr. Ball and Dr. Humphrey with us this morning, but I doubt whether we can go any more fully into the work. We would like to hear from Dr. Hartley now. We are very much obliged to you for your very interesting statement.

STATEMENT OF MR. CHARLES P. HARTLEY, PHYSIOLOGIST IN CHARGE OF CORN INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

Mr. HARTLEY. We are conducting our field investigations in cooperation with interested corn growers on their own farms. All of our field work is at the present time conducted in that way. Fortunately, investigations started in a small way in 1900 and 1901 have furnished some results that have proven of great value in aiding the demonstration work which has so recently received such a stimulus. We consider it our obligation to furnish the fundamental facts concerning the improvement of corn and methods of corn production and culture for which the money is appropriated. In doing this we have developed a number of higher yielding and better strains of corn, which yearly are undoubtedly returning to the country more than the entire cost of the work that has been put upon them. This photograph [exhibiting] shows a variety that we have improved for the conditions of southern Wisconsin, which is benefiting the New England dairy farmers as an ensilage corn and is superior as an early variety for grain production in Northern States from Pennsylvania to Colorado.

Mr. STEELE. What is the name of that?

Mr. HARTLEY. It has never been named. We first began to work on it in 1905. We designate different strains by numbers, and this strain is pretty well known throughout the United States as "U. S. Selection No. 133." Another strain, "U. S. Selection 77," that we have worked with since 1901 has given an increase of at least a bushel to the acre per year during the time that has been spent upon it. It is now 15 bushels better to the acre, as determined by reliable methods, than it was when the work was begun. I will pass around a few photographs showing phases of our work in the development of these better varieties.

We have found that one thing we can pass on to the demonstrator at this time is the advice to lay in a large supply of seed of these superior strains when the season is good, in order to prevent their extinction by unfavorable seasons, which are apt to occur in northern and semiarid regions.

Mr. DOOLITTLE. Do you carry that seed corn over from year to year?

Mr. HARTLEY. Yes, sir; it can be done without danger to viability or productivity, for four or five years, if it is properly dried as soon as it matures.

Mr. [illegible]AUGEN. Has that been tried out about four or five years?

[illegible]LEY. Yes, sir.

Mr. HAUGEN. What suggestion have you to make as to storing it?
Mr. HARTLEY. We have another heading, the selection and preservation of seed, which will cover that.
Mr. HELGESEN. North Dakota at one time was not considered a corn-growing State, but in recent years it has been growing corn more extensively. This year we had the worst frost in 30 years, and it has practically wiped out our seed for early varieties in that country. Do you know of any place where seed could be obtained that might give them a start again on early corn in North Dakota?
Mr. HARTLEY. Yes, sir. We have a card catalogue which was scattered throughout the fall of last year, giving sources of seed of varieties suitable for Northern States.
Mr. HELGESEN. You think there are some varieties that would become acclimated soon up there?
Mr. HARTLEY. Yes, sir; and there is seed of varieties that have been tested there, although not produced there last year. Northern grown seed of these varieties should give satisfactory results in North Dakota. Having mentioned Wisconsin, I might as well mention that we have also produced better and higher yielding varieties for other sections of the country, three of them for Maryland and Virginia, two for Ohio, one for Nebraska, one for California, and five for Texas, Oklahoma, and Louisiana. These we have worked with sufficiently long to get a record of their superiority. We have taken up work with some others recently which have not yet been improved to a great extent. One of the promising features of our work is the fact that the varieties shown in the photographs are now as responsive to our methods of breeding as they were 15 years ago when the work was begun. The committee received during the Saturday and Monday sessions such a comprehensive view of the many influencing factors encountered in standardizing grain grades that I can save a good deal of time by stating that the factors encountered in the improvement of corn and methods of corn production are more numerous and more complex. The one has to do with the dormant seed, the other with the growing plants.

Under the second heading I will say that sufficient work has been done to prove the practicability of developing special purpose varieties, such as varieties of high oil and of high protein content whenever there is a sufficient premium for such corn. At the present time we are spending about $2,000 in improving the texture, flavor, and popping qualities of pop corn and studying the factors which influence them.

The third heading is the one under which we study the effects of heredity and environment. We make our tests of heredity and environment at the same places and in conjunction with the practical breeding work. We have determined a number of things of fundamental importance wherever corn is grown. We have learned that self-fertilization and close breeding are very detrimental to productivity, and we have learned that sometimes cross breeding will result in a remarkable increase in productivity. We have not reached the blue-print stage, where we can tell a farmer how he can unfailingly originate a higher yielding variety, but by experimental tests we have developed breeding methods that have resulted in the origination of higher yielding varieties under different environments.

Mr. [illegible]. Now, Doctor, we have with our farmers so many barren stalks. You go through a field and apparently you have a fine stand, and everything looks fine, but if you go through and count them you will find that you have a very great percentage of blanks, will be out of them. Have you discovered any remedy for that condition?

Mr. HARTLEY. Barren or blank stalks are due either to heredity or to environment. In one or perhaps both cases the remedy must come from the standpoint of breeding methods that prevent self-fertilization of the tassels and pollination from barren stalks. Lack of moisture or fertility or heat and light is unnecessary to the planting of barren stalks. The practice of cultural methods designed to overcome these causes will not be a partial remedy.

Mr. STEELE. What I mean is that our farmers feel that they have a good stand of corn and we pull the best ears in the fall or get seed corn from our neighbors but we get so many blanks. I can see that year after year we are getting more of these blanks. Have you studied that feature of it?

Mr. HARTLEY. That brings up a point that really illustrates where some of the breeding of corn breeding has been injurious rather than as was thought. It shows the need of the determination of fundamental principles before we begin to positively tell farmers how to breed corn. Undoubtedly many of these blanks are due to close breeding and self-fertilization and that process has been really stimulated in the desire to produce show type ears.

The CHAIRMAN. Might it not be produced by chemicals in the soil—for instance, phosphoric acid?

Mr. STEELE. No; it seems to be increasing on bottom land where you ought to raise 100 bushels to the acre. If you go through and count the rows right through, you will find that you have 25 per cent of blanks. You stand off and count the stalks and you appear to have a very good crop, but if you investigate it closer you will find that you have not. That is a very important subject that I feel the department ought to investigate.

Mr. HARTLEY. We feel that way, too, and under the next heading I am going to touch on that.

Mr. HAUGEN. Are these blanks due to the exhaustion of the soil?

Mr. HARTLEY. They may be due to several causes.

Mr. HAUGEN. You have not studied the causes?

Mr. HARTLEY. We have been studying a number of factors that may cause that condition. We can produce a corn of most any type that is desired. We have great variations already existing. The important point, and the point that we are bearing in mind, is that it is not sufficient to get a corn that is, for instance, weevil resistant if it is otherwise of no account. We are holding as our main aim the origination and production of corns that are of practical benefit in different sections of the country.

This photograph [indicating] shows the transmission of character. This crooked-row ear [indicating] reproduced crooked-row ears like these [indicating]. A straight-row ear reproduced straight-row ears like these [indicating]. Self-fertilization reduces productivity. These are sister ears produced on the same stalk, and these rows grew side by side. One seed ear was fertilized with pollen from the stalk on which the ear grew; the other seed ear was fertilized with pollen from another stalk. This [indicating] is an illustration of adaptation to

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orm resistance is shown in this photograph of an ear-to-row ding plat. This row [indicating] shows an inherent ability to stand storms whereas this adjacent row [indicating] is badly ed.

ow, here is a feature we have not yet taken up but regard as nising. We have observed that some corns will germinate at r temperatures than others. We have observed that some varie- and some individuals within the variety will endure lower tem- atures in summer and continue to grow, and some varieties will w a remarkable frost resistance in the fall and in the spring; that ome of them are killed by frosts that others will withstand. With information at hand, we believe that in a few years' time we could velop corn for the Northern States which would continue to grow ing the low temperatures that sometimes prevail there. We know t in the course of years we could produce a corn that would con- ue to grow at the temperature at which oats thrive.

Mr. HELGESEN. That is very important in the northern section of the country.

Mr. HARTLEY. Under the heading of "Selection and preservation seed" we have shown that good seed will hold its viability and productivity for five or six years. We have also shown that seeds improperly cared for may be reduced in productivity without injury to its germination. This we consider very important in combating the idea prevalent among farmers that if they get a good stand of plants they are doing well. But a good stand is not all, for if the plants come from seed not properly cared for they may yield 10 to 15 bushels less per acre than they would have yielded if the seed had been well cared for.

Mr. HAUGEN. Under what conditions will corn keep for five or six years? How is it to be stored?

Mr. HARTLEY. If it has matured thoroughly, germinates well, is dried promptly, and is kept reasonably dry and at a reasonably uniform temperature, it will hold its viability for five or six years. It does not require any costly place to keep it that length of time. We have kept it in attics or sheds for that length of time in the North, but in the South we have to be more careful on account of damage from insects.

Mr. HAUGEN. I have been told that it is not safe to keep it beyond two years. In my State many have seed corn two years old and many are afraid to risk it because it has been dried out and is believed not to be of much value as to germination. I take it that the treat- ment or the storing of the corn has something to do with it.

Mr. HARTLEY. Yes; and perhaps the seed to which you refer was not very good seed at the beginning. Our investigations show that f seed germinates only 80 per cent the first year, the next year

it will germinate 40 or 50 per cent, and the next year probably be dead, whereas if it is perfect seed it will germinate 100 per cent the first year and retain about the same viability for at least four or five years.

Mr. DOOLITTLE. What does frost do to the corn?

Mr. HARTLEY. Very little damage if it is dried out, but we do not know at what temperature seed corn should be kept, and we have not had the facilities to determine at what temperature the seed ought to be kept to retain its optimum productivity. We have conducted experiments which indicate that it is possible to get the seed corn too dry.

Mr. HELGESEN. Now, in storing corn in the attic in the summertime it will get the extreme heat coming through the roof and in the winter time it will get the extreme cold because it is so near the roof. Would not those two extremes of temperature have an effect upon the corn?

Mr. HARTLEY. Not sufficient to reduce its value if it is dry. The heat that it would get from the roof in the fall would be an advantage in drying it, and after that time it will hold its viability for four or five years, if it is good in the beginning. Perhaps it would be better to give it another place after it becomes thoroughly dried. In fact, we think we have found out that it is a little better to shell it in a few months after it becomes dry, so that it is less exposed to changing humidity and temperature conditions.

Mr. HELGESEN. Would it be proper to shell it and put it in containers that are practically air-tight?

Mr. HARTLEY. Yes, sir; if the moisture content is reduced to 10 or 12 per cent. It ought also to be cleaned and made free from dust.

The last heading is the culture of corn, which is a very important and expensive line of investigation—much more expensive than those lines to which we have been giving the greater part of our attention. We have been spending our limited funds on the improvement of corn by breeding because we could do this to great advantage in cooperation with interested farmers. The farmers are very glad, especially those who have cooperated with us for several years, to conduct the work with us because of the advantages they get from the cooperation. But there are certain cultural experiments and breeding experiments necessary in our investigations which are not immediately profitable to the farmer and can not be properly conducted in cooperation with him. Permanent field stations are required to conduct such experiments.

Mr. HELGESEN. In a great country like this, with such a great difference of climatic and soil conditions, naturally you would have to experiment as to where corn can be grown under certain conditions?

Mr. HARTLEY. Yes, sir. We would like to experiment where the corn is to be grown. In fact, our work is carried on in corn-growing sections almost exclusively.

The CHAIRMAN. The committee will stand in recess until tomorrow morning at 10 o'clock.

(Thereupon, at 12.30 o'clock p. m., the committee took a recess until Wednesday, January 26, 1916, at 10 'oclock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Wednesday, January 26, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

STATEMENT OF DR. W. W. GARNER, PHYSIOLOGIST IN CHARGE OF TOBACCO INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, take up item No. 87, "For the investigation and improvement of tobacco and the methods of tobacco production and handling." There seems to be an increase in that item of $2,500.

Dr. TAYLOR. Yes, sir. Under this item, Mr. Chairman, the work upon tobacco both with reference to culture and curing is done, so that this includes both tobacco growing and tobacco curing to the extent that it is a feature requiring the attention of the producer.

The increase of $2,500 included in the estimates is desired in order that work not hitherto possible may be undertaken in the State of Wisconsin where there are troubles which the State authorities, including the experiment station, have been urging the department to cooperate on for two or three years back.

Dr. Garner, who has charge of this work, is with us.

The CHAIRMAN. May I ask you before you take your seat: Does this work involve the study of the tobacco beetle, or does that come under Dr. Howard?

Dr. TAYLOR. That comes under Dr. Howard, of the Bureau of Entomology.

The CHAIRMAN. Does this involve the work of spraying for this tobacco worm we had a year ago?

Dr. TAYLOR. No, sir; that comes under the Bureau of Entomology.

The CHAIRMAN. That is under Dr. Howard?

Dr. TAYLOR. Yes. This is the study of the curing and the attention to certain obscure diseases which give us trouble.

The CHAIRMAN. I have had a number of letters recently in behalf of some appropriation in this bill for the continuance of this work of eradicating the hornworm, I believe they call it, which seems to be prevalent in Kentucky, Virginia, and Tennessee.

Dr. TAYLOR. That would be under the Bureau of Entomology.

Dr. GARNER. I have placed on the wall a small outline map which is intended to show the distribution of tobacco culture and also shows the location of our field stations. It will be noticed from this map that the industry is localized in certain definite areas, and these colors and tracings are intended to show the types. Each of those areas

represents a different cultural type. The tobacco crop differs from most of our staple crops in that respect. Instead of a single crop we really have a number because, while the species or varieties may be the same, the methods of production are quite different and the uses are quite different, so that they might be compared, perhaps in some respects, with the differences between wheat, oats, and rye. Some of these types are used entirely for making cigars; some are used entirely for export; some are used entirely for the manufacture of chewing and smoking tobaccos, and some are used for two or more of these purposes. The fact that we have so many different types makes it necessary to take up work in each of these sections separately so far as may be possible, so that instead of looking over the problems in eight types that there is some duplication or repetition, it simply means that we are applying certain general methods to these various types, but modifying methods of detail to meet certain requirements in each case.

The Chairman. Why would it not be a good idea for you to take up your New England cigar-wrapper investigations and then next come your Main and export tobacco investigations? Just take those up very briefly, Doctor, will you?

Dr. Garner. In the case of the New England cigar-wrapper leaf, I might mention first the earlier work of the department in establishing the shade-growing industry as we know it. That has become firmly established now, and they are growing each year about 3,000 acres of this tobacco under a cloth shade.

The Chairman. How many pounds is that?

Dr. Garner. The yield is about 1,000 pounds to the acre, so that would represent about 3,000,000 pounds of tobacco, worth, I should say, $3,000,000, in round numbers.

The Chairman. That work was inaugurated by the department some 10 or 12 years ago, was it?

Dr. Garner. About 12 years ago.

The Chairman. And that is an established industry?

Dr. Garner. That has become firmly established now and is in a flourishing condition.

The Chairman. All right; what else are you trying to do?

Dr. Garner. The steam sterilization of seed beds is a more recent line of work that has proven very helpful to us and has become very largely adopted in New England. That is a method of controlling diseases and weeds in the seed bed.

We have done, also, quite a lot of breeding work in New England. This has special reference to the development of methods, so that it is more technical than our breeding work under other projects.

Another line of work that we have given special attention to is curing by artificial heat in the curing barns to avoid losses from the disease usually spoken of as pole sweat. When too much moisture is allowed to prevail in the barn the leaf decays, and that often involves the loss of a million dollars in New England in a year. We have shown, I think, that the use of artificial heat under proper conditions will entirely control this difficulty. I will pass around a picture showing a general view of the shade industry, together with one of the methods that we devised of applying artificial heat.

The Chairman. Are the tobacco growers following your method of curing?

GARNER. Yes, sir; they are. That is being used more and more ear.

CHAIRMAN. Have you completed that curing process, or are ome further studies to be made?

GARNER. The problem now is one of establishing, possibly, alized plant for curing. That will need careful consideration. are possibilities in it, but it has yet to be determined whether racticable or not. The proposition is, instead of having so barns as they do now, to use a centralized plant, somewhat he fashion of a centralized heating plant for buildings; it is ewhat similar problem.

breeding work also needs to be continued until we can work out the methods that can be applied not only there but to the other o-growing sections.

ing next to the project of the Maryland export-tobacco investi- s, the breeding there has been along more practical lines, and ld like to call attention to a type that we have developed and we think is of especial value [exhibiting photograph]. You note that it is very large, very vigorous, and a heavy yielder. will be grown this year by quite a number of farmers, as we btained quite a supply of seed, which is being placed in the of the county demonstrators.

HAWLEY. What are you breeding for; what do you hope to

GARNER. A larger yield.

HAWLEY. And a better quality?

GARNER. Possibly better, but primarily to increase the yield t changing the quality.

HAWLEY. Do you expect to develop in this country a type of o that will supplant imported toboccos like those from Cuba?

GARNER. No, sir. I think it is pretty well established now uban tobacco grows in Cuba, Turkish tobacco grows in Tur- nd American tobacco grows in America.

HAWLEY. Due to the soil and climate?

GARNER. It is due to the soil and climate, and we can not it. I think that fact is pretty well established.

McLAUGHLIN. You might change the soil.

GARNER. The soil is the controlling factor. We believe the more important than climate, but both are important.

McLAUGHLIN. You can control the soil by adding certain es by the use of fertilizer?

GARNER. No, sir. No one has yet been able to discover just t is in the soil that produces these types, and these conditions are not susceptible of measurement.

McLAUGHLIN. Why are you sure it is the soil, then; or are re?

GARNER. I think so for this reason: Take two types of tobacco on the same farm in Virginia, for instance, the only difference the character of the soil. We will find one type being grown port only and another type being grown as a flue-cured to- which is used in this country for chewing and smoking.

McLAUGHLIN. You say that two pieces of soil are different ach other. Are you able to determine that? When you say

our soils are different from the soils in Cuba, you have not shown that conclusively.

Dr. GARNER. I might say with reference to that that some years ago it was found that the soils in some of our Southern States resembled very closely the Cuban soils, so that Cuban seeds were grown and Cuban methods used, but we did not get Cuban tobacco; we got a rather poor substitute for it. It resembled Cuban tobacco but the resemblance was just enough to suggest Cuban; it was not real Cuban tobacco. It was neither the one nor the other with respect to our commercial types.

The CHAIRMAN. Did you try that out long enough, Doctor, to get the seed acclimated, as it were?

Dr. GARNER. Yes. The seed improved, but so far as the aroma was concerned there was no improvement, and that is an important factor in tobacco. It seemed to take the aroma of our tobacco, which is not what we wanted in that case. We want the Cuban aroma. If grown in this country the Cuban tobacco soon loses the Cuban aroma and takes an aroma more like our tobaccos, which is really getting away from what we wanted.

Mr. HAWLEY. In this experiment that you have conducted in Maryland, where you have increased the yield, could you also increase the quality of the leaf or not?

Dr. GARNER. To some extent. That is the all-important problem in tobacco. We must at least maintain the quality of the present tobaccos if we can not improve them in quality.

Mr. HAWLEY. Your experience is that an improvement of yield results also in an improvement in quality?

Dr. GARNER. Sometimes, but not always.

I want to refer to the work on the cover crops in Maryland and mention just a few figures regarding the use of crimson clover and vetch as cover crops for tobacco. Beginning in 1912, the first experiment with crimson clover as a cover crop yielded 570 pounds of tobacco per acre, valued at $48. In 1915 the yield had increased to 1,404 pounds, valued at $131. Similar or even better results were obtained with hairy vetch as a cover crop.

Mr. MCLAUGHLIN. When is it turned under?

Dr. GARNER. Early in the spring in both cases. The crimson clover and the vetch are both turned under in the spring.

Mr. MCLAUGHLIN. How old do you permit it to be before it is turned under?

Dr. GARNER. When it reaches a height of 8 or 10 inches. That is a very important factor, of course.

Mr. MCLAUGHLIN. You mean, do you not, that the vetch is put in the fall and turned under in the spring?

Dr. GARNER. Yes, sir; that is the idea.

The CHAIRMAN. All right, Dr. Garner; take up your Burley tobacco investigations.

Dr. GARNER. Our work on Burley tobacco is not very extensive at the present time. We are working only a small area in the West Virginia portion of the Burley section. We are concerned there mostly with bringing the methods up to date. In West Virginia they are backward about methods of growing and curing, and we are attempting largely to introduce the methods that are successfully applied in Kentucky. There is, I think, one important problem

at has come up recently in the Burley regions that I will refer to ter.

The next project is the western fire-cured tobacco investigation. his is a type which is really our oldest type of tobacco, and it is out the only one in which there has been no increase in the demand r many years. So that it is merely holding its own in foreign arkets and, inasmuch as there is no demand for it in this country, it becoming more and more apparent that in these regions more atten- on will need to be given to diversification and the substituting of her money crops for tobacco, because in late years Burley and flue- ired tobacco, particularly, have come in as competitors of fire-cured bacco in the foreign markets; and, as I said, the fire-cured tobacco s no market in this country.

The CHAIRMAN. What do you mean by fire-cured tobacco?

Dr. GARNER. That refers to the method of curing the tobacco; it smoked in the process of curing. This tobacco is largely grown on eavy soils, so it is a very strong tobacco; that is, it has a strong reosotelike odor and an aroma which makes it unfit for use in this ountry.

Mr. LEE. Is this grown almost exclusively in Tennessee and Ken- ucky?

Dr. GARNER. That is the western district. This same type is also rown in the Piedmont section of Virginia. Our methods there, then, re along the line of intensifying with the idea that this tobacco ould best be grown on a restricted acreage, using more intensive ethods, so as to enable the farmer to get increased yields and per- aps grow it at a decrease in cost. There seems to be little prospect or further development of the markets and we may expect that the rice will not be as good, perhaps, as it will be for our other types.

Mr. HAWLEY. Where is it sold abroad?

Dr. GARNER. England is our largest buyer; and Italy, Austria, ermany, and Spain all take it.

Mr. HAWLEY. For what do they use it?

Dr. GARNER. They use it for pipe and for cigars; but, of course, hey are entirely different cigars from what we are accustomed to in his country.

Mr. LEE. Do they grow any other type in west Tennessee and entucky except this?

Dr. GARNER. There is a type which is intermediate between Burley nd fire-cured, which is what we call dark air-cured tobacco. That ands midway between the Burley section and the fire-cured sections the extreme western portions. This [illustrating] is representa- ve of dark air-cured, this is fire-cured, and this is Burley.

The CHAIRMAN. Take up your next work, "New York binder and ller tobacco investigations."

Dr. GARNER. In New York State we have been concerned mainly working out the fertilizer requirements of the filler crop in the orthern portion of the State and in developing methods of rotation dapted to this tobacco; and in the binder section, or the southern ction of the State, the fertilizer problem alone has been considered. our early work we dealt with the more improved tobacco soils, but ore recently we have taken up the so-called run-down tobacco soils nd are applying methods of rotation and fertilization to develop e best method of handling these impoverished soils.

In the next project we have three tobaccos represented. All three of those are grown in Virginia but may be fine cured in North Carolina and South Carolina. The work in Virginia was first taken up and has developed to a point where we have largely turned our facts over to the demonstration agencies, so that we are not doing very much work in Virginia at this time. We are concentrating the work in North Carolina and, to a less extent, in South Carolina. We have several new problems to deal with. In North Carolina the matter of the control of the Granville wilt has received most serious attention. This is an extremely destructive disease and in Granville County does enormous damage. By a system of rotation in the growing of crops that are not affected by this organism we have been able to show that this wilt can be controlled. I have a few here [producing photographs] representing one of those experiments.

Mr. HAUGEN. In growing tobacco, do you suggest the rotation of crops?

Dr. GARNER. Not in all cases, but in most cases. That depends on the type of the tobacco. With the sweet type, in New England, the land will not be ruined.

Mr. HAUGEN. I understand the longer you grow tobacco the better the quality?

Dr. GARNER. That is true of certain types and under certain conditions, but not always.

Mr. HAUGEN. I think that is true in Wisconsin.

The CHAIRMAN. Proceed, Doctor.

Dr. GARNER. Another problem I wish to mention, and which is of special interest this year, is that of potash for tobacco. In the Carolinas last year our experiments showed that when we applied only 30 pounds of potash to the acre the increase in value of the crop was $150 for each pound of potash used.

Mr. HAUGEN. $150 a pound for the tobacco?

Dr. GARNER. I mean I would pay the farmer to expend up to $150 a pound for the potash for the first 30 pounds in those soils.

The CHAIRMAN. You mean $150 a pound for the potash?

Dr. GARNER. Yes.

A third line I wish to mention in North Carolina is that of curing. In this case they use a small barn and the tobacco is cured with heat—with fires—the process being completed in three or four days. This involves the use of a large quantity of wood, and on many of the tobacco farms the wood supply is gradually exhausted. We have devised recently a new type of barn which cuts the fuel consumption in half, and now we are working on the problem of developing a method of using coal instead of wood, so as to eliminate wood entirely.

The CHAIRMAN. Suppose you take up your next, which is "Pennsylvania cigar filler-tobacco investigations."

Dr. GARNER. In Pennsylvania our work in the Lancaster district has been confined mainly to breeding, and we have been developing an improved strain of Pennsylvania filler leaf. This strain, which we have selected as the best, is known as the Slaughter, and we find that it gives increased yields over the ordinary types grown. There were perhaps 1,000 acres of this tobacco grown this past season. It seems to meet all of the requirements of the farmers and is becoming

popular. Another problem of importance has been that of poor burning qualities of the cigar types of Pennsylvania. In some respects they have not burned as well as they should, and we have found that it is due, in a large measure, to the use of improper fertilizer, especially in the matter of potash. They use kainit and muriate of potash, containing chlorine, and that has been detrimental to the burning qualities.

Miscellaneous investigations cover the more technical laboratory and greenhouse work, involving the study of the chemistry and physiology of the plant with special reference to the curing and handling. The work here, in short, furnishes the fundamentals for our more practical field experiments. Nearly all of the improvements I have mentioned in the field projects have come as the result of the preliminary work of a technical nature included under this miscellaneous project.

The CHAIRMAN. Those are your laboratory methods, are they?

Dr. GARNER. Yes, sir.

The CHAIRMAN. I had a letter yesterday from some gentlemen in Virginia calling attention to what he called the mosaic disease, which I see mentioned here on this project. What is that?

Dr. GARNER. I would like to mention that particularly. We might call that a classical disease. It occurs the world over where tobacco is grown. Recently we discovered that plant lice or aphides are largely responsible for the dissemination of this disease. It is a question, then, of controlling these aphides as far as may be possible. They probably can not be controlled in the field, but we hope they can be controlled in the seed beds. As a matter of fact, most of this injury comes from infection in the seed beds; and, if methods can be developed for controlling the insects, we hope the trouble will largely right itself.

Mr. HAWLEY. That is, they bite the plants before they are transplanted?

Dr. GARNER. Yes, sir; in the seed beds. I might say, though, that the control of these insects is a problem for the entomologists. We have simply made the discovery that they are responsible for the control of the insects which disseminate the disease.

Mr. LEE. Is that supposed to be the same disease as apple-tree rot?

Dr. GARNER. No, sir; it is a distinct disease.

The CHAIRMAN. Is it akin to this cucumber mosaic disease?

Dr. GARNER. It is a complex problem. I think Mr. Orton is working on this cucumber disease, but I am not in a position myself to state.

The CHAIRMAN. It seems to have the same habits.

Dr. GARNER. There are striking similarities; yes, sir. They are certainly both mosaics. It is simply a question of how close relationship there is between the two.

The CHAIRMAN. You would say, then, that so far as your work was concerned, you have discovered the disease and the method of transmission, and the cure for it must be found by the Bureau of Entomology?

Dr. GARNER. Yes, sir; as regards the insects.

The CHAIRMAN. I asked that question because I wanted to know whether or not there was any need for an increase in this item to fight this mosaic disease.

... [illegible] ... a word regarding a new line of work that we ... [illegible] ... There are two problems of special importance in Wisconsin. ... [illegible] ... seems that the industry, I think is more or ... [illegible] ... something can be done. The first of these is a ... [illegible] ... which has come to be known as blank root. I have ... [illegible] ... following photographs illustrating what the root ... [illegible] ... shows at the one side a normal root of tobacco and ... [illegible] ... which is not worth harvesting, the injury be... [illegible] ... I just show here a view illustrating the ... [illegible] ... of resistance of the different strains to this disease, and ... [illegible] ... of controlling it so far as the seed bed is concerned. ... [illegible] ... matter of sterilizing by steam, which I mentioned earlier ... [illegible] ... disease in the seed bed. The problem now is one of ... [illegible] ... in the field. I might say that this disease, this past year, caused a $10,000,000 worth of damage to the tobacco crop ... [illegible] ... country.

Mr. HOWARD. What is the cause of that?

Dr. GARNER. A fungus, as it is called, which attacks the roots of the plant. It is an infectious disease, so that the farmer ... [illegible] ... suspect its presence.

Mr. HOWARD. Does it affect any other plants?

Dr. GARNER. It affects quite a number of plants.

Mr. HOWARD. What others?

Dr. GARNER. There are a number. For example, most legumes ... [illegible] ... That is an unfortunate thing about it, because it elimi... [illegible] ... opportunity of rotation that might be developed with thes... [illegible] ... The grass family, including cereals and corn, are ap... [illegible] ... practically quite resistant to it.

The CHAIRMAN. Does it act the same as the wilt in cowpeas and ... [illegible] ... of that type?

Dr. GARNER. No, sir; there is quite a marked difference in this re... [illegible] ... The farmer would immediately recognize the wilt. Anyon... [illegible] ... would, of course, because of the wilting down of the leaf and stem. ... [illegible] ... disease produces no very characteristic symptoms; simply th... [illegible] ... plant does not grow. The farmer lays it to the fertilizer or the sea... [illegible] ..., or probably the seed or some other condition. I would like t... [illegible] ... say at this point that the trouble I mentioned in the Burley sec... [illegible] ... tion.

Mr. ANDERSON. Is it not easily discovered if the farmer goes un... [illegible] ...der the ground and looks at the roots?

Dr. GARNER. Yes, sir; if he does that he would see at once that th... [illegible] ... trouble lies there with the roots. It has been known for many yea... [illegible] ... that in the Burley section they can only grow two crops of tobac... [illegible] ... on the land, and then it must be seeded down to blue grass for six ... [illegible] ... eight years before they can grow tobacco again. No one has know... [illegible] ... the cause; but, as the result of a preliminary examination this se... [illegible] ...son, we believe the whole trouble lies with the root rot, which is th... [illegible] ... cause of special trouble in Wisconsin. It has also been found th... [illegible] ... the disease thrives under the artificial shades of New England, und... [illegible] ... which the tobacco is being grown. It is a very serious disease. It ... [illegible] ... not confined to Wisconsin, but the conditions there are particular... [illegible] ... favorable for study, and it is particularly serious in that section.

The second trouble to which I wish to refer is the packing-house black rot." That is simply a rot or decay of the leaf after it reaches he packer. This disease has been so serious in Wisconsin in recent ears that some of the largest buyers have considered the matter of ntirely withdrawing from that section. In Wisconsin tobacco is rown as a binder crop for cigars, and it is quite an important one, nd an important source particularly of the binder leaf for the manu- acturers.

I have views here [producing photographs] giving an idea of the eneral appearance and effect of this disease.

The CHAIRMAN. What is it, a parasite?

Dr. GARNER. We can not call it a parasite because the leaf at- acked is already dead.

The CHAIRMAN. It affects the leaf?

Dr. GARNER. It is simply a rot of the leaf. This [showing photo- graph] is the leaf, and that shows the rot. It is a decay of the cured leaf.

The CHAIRMAN. Is it a fungous disease?

Dr. GARNER. Yes, sir; it is a fungus that causes the decay. We have reason to believe, from our laboratory work, that this problem can be controlled very readily, but it will require cooperation with the packers on a large scale to establish the fact. Our idea is that we must modify the methods that have been applied with certain other types of tobacco in the matter of handling, as it is called, or redrying. The trouble appears to be one of moisture in the tobacco, and the quantity of moisture permissible, without having this trouble, has not actually been determined. We have not had the opportunity as yet to determine just the procedure that will need to be used in adapting the methods now used with other tobacco for meeting this trouble.

There are other cultural problems in Wisconsin in the matter of fertilizers, etc., but they are completely overshadowed by these dis- eases, so that we can do nothing with the cultural problems until we have first met these diseases.

The CHAIRMAN. You speak of a mold in your notes here. Is that an additional problem that you are dealing with in Wisconsin?

Dr. GARNER. Yes. That is general. Tobacco is liable to mold at any stage after it is cured. Even the manufactured cigar frequently molds in the box, so that it is largely the same sort of trouble as the rot.

The CHAIRMAN. Is there anything further you wish to state?

Dr. GARNER. No; that is all.

Mr. HAWLEY. What is the total annual value of the tobacco crop n this country?

Dr. GARNER. About $100,000,000.

Mr. HAWLEY. Is that value increasing or decreasing?

Dr. GARNER. It has been increasing, so far as there has been any hange—a gradual increase. That has largely been due to the in- rease in our flue-cured tobacco in Virginia and the Carolinas. That as increased enormously.

Mr. HAWLEY. Have you estimated what amount of loss results to ie tobacco growers annually from the diseases you are dealing with nder your appropriations?

Dr. GARNER. Of all these diseases?

Mr. HAWLEY. Of all of these—the total annual loss?

Dr. GARNER. It is, of course, quite variable with the different seasons, but it would be over 10 per cent—that is, it would certainly be over $10,000,000.

Mr. HELGESEN. How much would the loss be if you did not do any work along that line—let it take its natural course?

Dr. GARNER. Where we have really completed the work, or substantially so, it would make a material difference. I could not say offhand, because I would need to consider and to foot up the different items. I might mention, in connection with this Granville wilt, that Granville County, N. C., enjoys the reputation of growing the finest flue-cured tobacco in the world. In all the southern half of this county this wilt prevails, in this portion of the county [indicating on map], and the land values have dropped off perhaps half on account of this wilt on the tobacco lands. The reason for that is that tobacco is the great money crop in that section. Immediately you pass out of this tobacco section into a general farming section the whole aspect changes—the nature of the homes, of the farms and barns, and everything—showing the tremendous effect of this disease on the prosperity of the farmer.

Mr. HELGESON. Decreasing the net returns on the land?

Dr. GARNER. Very markedly decreasing the net returns on the land.

Mr. HAWLEY. Is this $100,000,000 you spoke of the amount which the growers get or is that the amount the consumers pay?

Dr. GARNER. That is the farm value. The farmers get that. The value of the manufactured product is much greater, because there is $80,000,000 in revenue coming in from tobacco.

Mr. HAWLEY. Now, this $2,500 additional which you are asking for here is desired especially to improve the quality of the tobacco?

Dr. GARNER. To eliminate this loss so far as we can.

The CHAIRMAN. I understood that $2,500 was to be used largely in combating this black rot and mold and things like that in Wisconsin.

Dr. GARNER. Yes, sir; that is true, more particularly; but in the case of the black rot that will apply to all cigar-tobacco sections, because black rot is by no means confined to Wisconsin. It occurs in Pennsylvania, Ohio, and New England to a lesser extent.

Mr. MCLAUGHLIN. Could you give an estimate there of the extent to which the revenue is depleted by this particular disease?

Dr. GARNER. No, sir; I would not know just how to get at it in that way.

Mr. MCLAUGHLIN. You spoke of $80,000,000.

Dr. GARNER. Yes; that is about the revenue we get each year.

Mr. HAUGEN. Could you give an estimate of the increase in the yield of tobacco as a result of your investigational work?

Dr. GARNER. You mean for the country over, as a whole?

Mr. HAUGEN. Yes.

Dr. GARNER. It would be difficult to get at that unless we considered the different sections separately. In North Carolina, in this particular section, we increased the yield very easily 50, possibly 75 per cent.

MENT OF MR. CHARLES J. BRAND, CHIEF OF THE OFFICE ARKETS AND RURAL ORGANIZATION, AND IN CHARGE OF R-PLANT INVESTIGATIONS IN THE BUREAU OF PLANT STRY.

CHAIRMAN. Now, take up item No. 88, and we will hurry that as much as we can.

TAYLOR. Item 88 is the one under which we do our work with ce to the production of paper and similar products out of aterial, particularly waste crop material. It is the line on you will recall there was some discussion in connection with , inasmuch as there is this year the proviso in item 88 that nay be used for the purpose of testing and breeding flax with ce to increasing the quality and oil content of the seed. Under ons that existed when the fiscal year began, we found that it be practically destructive of very promising results that were t in connection with this work if so deep a cut was made in ds as the proviso authorized. The Secretary therefore took age of the proviso to the extent of $1,500 only for the flax- ork, as was mentioned in the discussion of item 86.

ow suggest in the estimates that, in lieu of this proviso, any e in item 86, which has already been discussed, and that the be omitted here, which will restore item 88 to the amount of that it has carried heretofore, leaving that full amount avail- r this very important work.

CHAIRMAN. That would really amount to an increase in item $1,500, would it not?

TAYLOR. In so far as the money used for paper-plant investi- this year is concerned it increases this item $1,500 and re- he figure to what the item has previously carried.

CHAIRMAN. Who is in charge of this work?

TAYLOR. Mr. Brand, Chief of the Office of Markets and Rural zation, with whom this has been essentially a personal project e work upon it was started. He will discuss the details of it.

CHAIRMAN. Just as briefly as you can, Mr. Brand.

BRAND. The conditions in the paper industry are extraordi- Mr. Chairman, at this time on account of war conditions; and, sult, materials that have not appeared promising in the past more promising now because prices are so high.

HAWLEY. How has the war affected the paper industry?

BRAND. For instance, in the matter of rope papers, for which f the raw product for America comes from abroad, the prices imbed up from about 80 cents a hundred to $1.80.

HAWLEY. From what part of the world abroad?

BRAND. Usually from Europe; from the industries. These ste ropes which are cleaned up and used. The same is true strings. They have gone up about 100 per cent in price.

then at this time we face a new condition, inasmuch as has put an embargo upon all chemical wood pulp, which tedly means that there will be a very active competition for Canadian pulp, which will probably increase our prices ada very markedly.

This is bringing some of these other raw materials more nea the surface as a commercial possibility. I will run over these ters very quickly, and I think I can show the character of the and the results which can be secured perhaps better by pa around a few samples of these materials than in any other We have been paying special attention during the past year t straw. The samples that I will pass around are one-third flax s one-third strings, and one-third sulphite screenings.

The CHAIRMAN. What is that used for?

Mr. BRAND. It is used as counterboard. A similar formul used for trunk boards.

That [indicating sample] is for shoe counters and for bobbi the cotton mills and all sorts of places where indurated fiber i be used.

The CHAIRMAN. It is a tough board, is it not?

Mr. BRAND. Yes, sir; a very tough board, indeed. And by the these samples were made under commercial conditions in the mercial mills, and the manufacturers have all been enthusiast the first time, practically, about flax-straw materials.

Here is another sample of a still different type, also largel straw.

We have, roughly, about 2,500,000 acres of flax a year, and th portion of the flax straw which is used is possibly the two to hundred thousand tons that go into tow manufacture for uphol

We are also making out of flax straw, in combination with other fibers, cement and flour-sack paper, such as shown i sample. I have only that one. This particular sample stood a folding test, which is an extraordinary test. It has great str and will be suitable, we believe, for cement sacking, which manding a great quantity of material at this time, also flour sa

Mr. HELGESEN. And for which it is very difficult to get good rial to make a strong enough sack.

Mr. BRAND. Yes; it is very difficult, indeed.

Mr. HEFLIN. Of what is it made?

Mr. BRAND. Flax straw and rope—half and half.

Mr. MCLAUGHLIN. How about the expense of that?

Mr. BRAND. It is getting down, we believe, where it is a pract proposition, the cost of other raw materials, as I explained outset, being unduly high.

Mr. HEFLIN. Of what character rope is it made?

Mr. BRAND. Manila rope, mostly; the oily, worn-out ropes industries that are cleaned up.

Mr. HELGESEN. In these heavier papers, etc., can you use prac the whole straw?

Mr. BRAND. No; we have to clean the shives out of it, Mr. Hel in order to use it.

Mr. HELGESEN. It is not as close as you would need for fine poses?

Mr. BRAND. No. We try to get it pretty clean, because it affe breaking strength and the tensile strength as well.

Mr. HEFLIN. Where was that made?

Mr. BRAND. That was made in our own laboratory. We l special equipment, much of which was designed for our ow

for treating all of these materials. But I am glad to say that we have been able recently to arrange with the paper mills to use their power and steam and pay them only the actual cost. They charge us just the same as they charge their own departments for this service and give us the benefit of their skilled labor and expert mechanics.

This [showing another sample] is unbleached cotton-stalk paper. We have almost given up hope of accomplishing anything in this direction on account of the agricultural problem and on account of the low yield per acre of the stalks; but I show you that to illustrate the situation.

Mr. HAWLEY. Is this a tough paper?

Mr. BRAND. No; it is not. It lacks seriously in strength; that is one of its problems. The fiber is so short it does not lend itself well to paper making.

Mr. MCLAUGHLIN. I understand the result of the experiment relating to this is not very satisfactory.

Mr. BRAND. It is not very satisfactory.

Mr. WILSON. For what do you use this?

Mr. BRAND. This is wrapping stock, Mr. Wilson.

Mr. WILSON. Is it strong enough for that?

Mr. BRAND. It is; but it can not compete with craft and other papers.

This [exhibiting sample] is a tough fiber paper made of waste flyings—the waste product from the hemp-fiber industry.

Mr. HAWLEY. Do you think, Mr. Brand, that these conditions which you speak of will continue very long after the war is over?

Mr. BRAND. No; I do not; but we have this hope, that once these materials are used they will continue to be used after the war is over.

The work on cornstalk has been progressing and we have now taken a new tack, in that, instead of trying to eliminate the pith cells, which have been a large problem in the past, we are adding other fibers to modify the character of the pulp, rather than attempting the expensive process of removing the pith cells. The work has been relatively successful, as shown by the samples I am passing around.

Mr. HAWLEY. Do you expect to make writing paper out of this?

Mr. BRAND. Book paper, Mr. Hawley. The price of book paper is about $5 a ton higher than it was just before the war broke out, because the bleach, and things of that sort, have gone up so greatly in price.

Mr. HAUGEN. At the present price of paper, at what would you estimate the price of cornstalks?

Mr. BRAND. The raw cornstalk?.

Mr. HAUGEN. As it comes from the field.

Mr. BRAND. We estimate that rather empirically, Mr. Haugen, from the standpoint of what the manufacturer can afford to pay as the manufacturing cost. We believe they might afford to pay $4 or $5 a ton.

Mr. HAUGEN. And that is based on the present price of paper?

Mr. BRAND. Yes.

Mr. HAUGEN. And what is the present price of paper?

Mr. BRAND. It varies for the different grades. Book papers are probably running from $80 to $140 or $150 a ton. News is relatively low, considering how high the prices of the other stocks are. Craft has gone up very markedly; it is now from 6 to 8 cents per pound.

Mr. HAWLEY. They are now making book paper out of wood pulp?

Mr. BRAND. Yes, sir; and sulphite has gone up from $2.75 or $3 per hundred to about $5.

Mr. HELGESEN. On this cornstalk paper you have raw material, "cornstalks," and then below that "furnish: Cornstalks, 40; sulphite, 21; soda, 39." What does that mean?

Mr. BRAND. Those are the three materials, Mr. Helgesen, that are combined in that sheet. One is made from poplar and the other from spruce wood.

Mr. HAWLEY. Does it take those three materials to produce this, then?

Mr. BRAND. Yes, sir; it takes those three materials.

Mr. WILSON. For what would that paper be used?

Mr. BRAND. Book paper.

Mr. WILSON. For printing?

Mr. BRAND. Yes, sir; high-quality book paper; fully up to the standard that is generally used.

Mr. WILSON. Would it do for letter writing?

Mr. BRAND. It would have to be modified in the size. The furnish for writing stock is different. The fiber could be used for both purposes.

Mr. WILSON. What is the expense of getting that out?

Mr. BRAND. It is higher at the present time than spruce or poplar pulp, but it is relatively nearer the same cost than it has been under previous normal conditions.

Mr. HAWLEY. What about hemlock and white fir?

Mr. BRAND. They are both used at the present time, although formerly the book and wood-pulp manufacturers declined to accept anything more than a small percentage. Now they accept 50 per cent of hemlock and fir in their spruce contracts.

The CHAIRMAN. All right, Doctor.

Mr. BRAND. That practically is all I have to say, except I want to show the progress that is being made. We believe we are coming to a point where we may realize on some of these things. We have, during the past year, published two papers, one on the utilization of flax straw and the other on the utilization of a southwestern grass, which is really more valuable to Mexico than it is to this country.

Mr. HAWLEY. What is the name of the grass?

Mr. BRAND. *Epicampes macroura.* The tops of that grass frequently grow 6 feet high; the tops are wasted, while the roots are harvested. The roots of this grass are used in making scrub brushes.

Mr. HAWLEY. Does it have a civilized name?

Mr. BRAND. Rice root, I think, is its most common name.

The CHAIRMAN. What is this yucca?

Mr. BRAND. The yucca is very widely distributed in the whole Great Plains and the southwestern part of the United States, where there are a number of species, one of which has given special promise.

The CHAIRMAN. What does it look like?

Mr. BRAND. I felt I was taking too much of your time and did not pass the [illegible]nple around. It is a distinct wrapping stock of very good prom[illegible] It is one of the wild plants of that section.

The CHAI[illegible] As I remember, a few years ago the department had a[illegible]oo[illegible]l upon the manufacture of paper out of these "[illegible]" as a hopeless undertaking.

Mr. McLAUGHLIN. That was on account of the economic conditions?

The CHAIRMAN. I was about to ask if, under the changed economic conditions, you feel now that it is probable that these various materials can be used?

Mr. BRAND. I feel distinctly that it is, Mr. Chairman.

The CHAIRMAN. In other words, you are taking advantage of the existing conditions to put the industry on its feet in the hope that it will keep on going after it is started?

Mr. BRAND. Yes, sir.

Mr. HAUGEN. Is there any prospect of utilizing cornstalk in the manufacture of paper?

Mr. BRAND. We believe there is; not at this moment, but ultimately. The problem with cornstalks is a very difficult and intricate one.

Mr. HAUGEN. I understand you to say that the value of the cornstalks to the manufacturing of paper is $4 to $5 a ton?

Mr. BRAND. Yes.

STATEMENT OF MR. T. H. KEARNEY, PHYSIOLOGIST IN CHARGE OF ALKALI AND DROUGHT RESISTANT PLANT INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Take up your next item, Dr. Taylor—item 89.

Dr. TAYLOR. Item 89, "For the breeding and physiological study of alkali-resistant and drought-resistant crops."

This item, Mr. Chairman, is one under which several projects intimately related to this general question of alkali resistance and drought resistance are prosecuted. We are not requesting any increase; we are asking merely for the amount that is provided in the current act, and Mr. Kearney, who is in charge of this work, will discuss these projects briefly.

The CHAIRMAN. Now, Mr. Kearney, if you can speed this up a little bit and still give us a pretty good outline of the work, we will appreciate it.

Mr. KEARNEY. This line of work deals with two of the most serious problems that agriculture has to confront in the Western States, the shortage of water and the presence of alkali salts in the soil, which materially cut down crop production.

The problem of drought is one that is more usually encountered in connection with dry-land agriculture, and the problem of alkali in connection with irrigated agriculture. So that our investigations along these two lines have been carried along in cooperation with the two offices of Dry Land Agriculture and Western Irrigation Agriculture, using their experimental farms as our basis for experimental field work. In addition to this, we have carried on laboratory experiments here in Washington.

The two problems, while at first glance they look dissimilar, are really rather closely related. We have found the effect of alkali on plant growth, even though the alkali soil may be wet, is really one of inducing drought. The alkali salts in the soil make it difficult for the plant roots to absorb water, so that the plants growing in alkali soil are really suffering from what is practically drought.

Mr. HAWLEY. What effect does the alkali have on the roots in absorbing the water?

Mr. KEARNEY. That, to a large extent, is a physical effect. It has been proven by experts that plant roots in a salt solution have difficulty in absorbing water. It is rather difficult to explain in a few words. Briefly, the physical process known as osmosis is at the basis of the matter, and the taking of the water out of the soil by the plant roots is regulated by that process; and the more you increase the salt content of the solution in which the roots are present the more the rate of absorption is slowed down until it reaches a point where the plant can not meet the loss of water from its leaves.

Mr. HAUGEN. Can you tell us how to reduce the salt?

Mr. KEARNEY. The question of alkali reclamation is largely an engineering problem, being a matter of drainage. It is a problem properly for the engineers, but at the same time it is very important that farmers having alkali lands to deal with should have some crop plants that they can be growing while the reclamation is going on or until they are in a position to undertake reclamation, which often means the organization of cooperative drainage communities before any work can be undertaken at all. The individual farmer usually is so situated that he can not get an outlet for his waste water unless a community drainage canal is built. And even after that is done the process of reclamation by drainage takes years to complete. The salt is washed out of the soil little by little, year after year, and during that time the farmer might be growing something; and at the same time he would certainly be keeping the soil in better condition if he had some crop on the land rather than by leaving it bare.

Another practice often recommended for alkali lands is the application of manure. Manure is helpful in the case of certain types of alkali lands. Alkali is usually most abundant in heavy alluvial soils occupying the river bottoms. Such soils often become puddled and hard and almost impervious to water. So that, even when there is an abundance of water to carry on reclamation, they do not get results very quickly unless they loosen up the soil, and the application of manure is one of the best ways of doing that.

Mr. HAUGEN. What about the use of ordinary farm manure?

Mr. KEARNEY. The use of ordinary farm manure is very good if there is not so much alkali in the land that it will not grow any crop.

Mr. HELGESEN. Do you not think manure neutralizes these salts?

Mr. KEARNEY. The chemical effect is not very well understood. The salts that form the alkali content of alkali soils are the common table salt, which is one of the most abundant; what is known as Glauber's salt, or sodium sulphate; and the ordinary washing soda, or sodium carbonate. So far as we know, none of these are neutralized by the presence of manure. The black alkali can be neutralized by gypsum.

Mr. HAWLEY. Is it not usually too expensive to use gypsum?

Mr. KEARNEY. As a general thing, the price is rather prohibitive, unless you are near a source of commercial gypsum. Where the land is very valuable, if you are growing some kind of an orchard crop or some crop which justifies a heavy expenditure on the land, the use of gypsum is economical: but for the ordinary field crops, in most localities, the expense would be pretty heavy. The black alkali,

which is neutralized by gypsum, occurs in only a very small percentage of the total alkali lands. Common salt and Glauber's salt are the types of alkali that are much more abundant throughout the West. I might say, in that connection, that it has been estimated that about 10 per cent of the irrigated land in the West is more or less impaired by the presence of alkali.

Mr. McLAUGHLIN. Is your work connected with the problem that was put up to us a few years ago, when these irrigation projects were developed and put into operation, and it was found that too much water was put on the soil and a draining process had to be gone through with, and that the ordinary irrigating of the soil made it too heavily alkaline and we had to do something to get rid of it?

Mr. KEARNEY. My own work is entirely with crops, with the plants, and the engineering and reclamation features of the work are handled by other agencies.

Mr. McLAUGHLIN. That was altogether an engineering problem that I speak of?

Mr. KEARNEY. I think so, in a broad way. Of course, the particular phase of the problem that deals with finding out what crops can best be grown on the land until it is reclaimed comes within this line of work.

Mr. HELGESEN. But there is one difficulty out in that section, caused by the use of water which is impregnated with alkali, and much land has been destroyed because of the fact that they did not understand that the water itself was unfit for irrigation.

Mr. KEARNEY. That is very true. That has been a frequent cause of trouble in many places in the West. Of course, if the water has a very high salt content, there is practically no remedy except the use of some other water; but, if the salt content is not too high, it can be frequently used for producing certain crops—not all crops, but crops that can stand more alkali than others. And our business has been to find out what those crops are.

Mr. HELGESEN. Speaking about manure not neutralizing it; we do not have much alkali, but out in our sections we find small spots in the fields here and there. I know a man who experimented with manuring. He put on a heavy coating of manure for several years, and he said that each year it increased the yield. In fact, it did not yield anything before he started, but after a few years of applying the manure he said those little spots began to produce the finest yields of the whole farm, and by watching it he found that crops planted on these spots would even ripen earlier than those on the rest of the field.

Mr. WILSON. Did the alkali disappear?

Mr. HELGESEN. It disappeared as far as the effect on the land was concerned.

Mr. HAUGEN. What is your idea about it?

Mr. KEARNEY. I think probably both things took place—that the putting on of the manure stimulated the crop and also caused some of the alkali to disappear, for the reason that these alkali spots are usually more or less impervious to water. By putting on the manure and plowing it in the soil becomes loosened and allows the water (either the irrigation water or the rainfall) to percolate through the soil, dissolving the salt and carrying it down with the water into the drainage.

Mr. HAUGEN. Washing it out?

Mr. KEARNEY. Yes, actually washing it out of the soil.

Mr. MCLAUGHLIN. Was it found that those alkali spots on which the manure was used yielded more than where there were no spots?

Mr. HELGESEN. It yielded more and the grain was finer and ripened a little earlier. But it takes so much manure that if you had a farm of alkali land you could not get manure for it.

Mr. MCLAUGHLIN. Then it would seem that the alkali is not all removed from the soil?

Mr. KEARNEY. It is almost impossible with a soil of a pretty high alkali content to get it all out. But if the conditions are such as to allow drainage, if you haven't got a water table pretty close to the surface of the soil and no outlet for it, you can generally get enough of the alkali out to secure some kind of a crop; not always the best crops, but something to the acre.

Mr. MCLAUGHLIN. But under the conditions explained by Mr. Helgensen it would not be possible to remove all of the alkali, would it?

Mr. KEARNEY. If you remove all the alkali, you are likely to wash all of the plant food out at the same time. If you carry the leaching process too far there is danger that you are going to wash out the nitrates and other plant-food elements; and it will be necessary to put them back again.

Mr. HELGESEN. I do not suppose the increased yield was caused by removing the alkali so much as it was by neutralizing the salts by the manure and fertilizer.

Mr. KEARNEY. I think it might have worked in both ways.

Mr. HAUGEN. In speaking of drainage, did you have reference to irrigated land particularly?

Mr. KEARNEY. Particularly; yes. The alkali problem is not a serious problem, as a rule, on any but irrigated lands.

Mr. HAUGEN. How about soil referred to by Mr. Helgesen? We find that all over our section of the country. What would you suggest?

Mr. STEELE. You have no alkali in Iowa?

Mr. KEARNEY. Where alkali appears on the land that is not irrigated and it does not permit of artificial drainage, and where it occurs in sufficient quantity to interfere seriously with the crops you are now growing we suggest growing something else.

Mr. HELGESEN. Now, let me ask you a question. We have a district, quite an extensive district, speaking in a small way, of several townships, where there is an extensive amount of alkali land, and it has not been successful in growing any kind of a crop before. When I was at home this last fall a man told me he had in a deal secured a quarter section of that land about three years ago. He tried an experiment and put it into alfalfa and discovered that it would grow a very excellent crop of alfalfa. Now, does that not indicate that alfalfa will stand more alkali than the cereal crops?

Mr. KEARNEY. It has not been our experience in most of the areas where we have worked. We have regarded alfalfa as a rather more sensitive crop than cereals, although it is true that after you get alfalfa started on the land, if you get the alfalfa seeded and the roots started, you can generally grow a crop on fairly strong alkali land.

Mr. McLAUGHLIN. What might that indicate—that this alkali is in the surface soil and the alfalfa roots go down into the deep soil and may get its nutriment from the soil down below where there is no alkali?

Mr. KEARNEY. It is very frequently the case that the alkali is accumulated at the surface of the soil by evaporation, and if you can handle your land in such a way as to keep the salt down, by irrigating before seeding, it is a comparatively easy problem. But if you are dealing with a region where you do not have irrigation, it is a question of seeding at the right time—after a heavy rain, for example. By putting in the seed immediately after the rain you can often get a stand, which will shade the ground and keep down the evaporation and delay the return of the salt to the surface, and then by the time the salt begins to move up again the crop will be pretty well started and the roots growing down. In this way we can sometimes get a stand of alfalfa on moderately alkali land.

Mr. McLAUGHLIN. I think I have noticed this, that where alfalfa is put on soil that is not very good, soil that has been depleted, it seems to me that the alfalfa, after considerable trouble, gets through that surface soil and goes below and finds plenty of plant food.

Mr. KEARNEY. I think that might easily be the condition in a great many places.

Mr. HELGESEN. Have your experiments indicated how far down the alkali will go?

Mr. KEARNEY. It is a condition that varies greatly in different places. As a rule, though, where the water table is near the surface, the alkali is apt to be accumulated at or near the surface; but in some regions of very limited rainfall and low water table the alkali salts are found to be deposited in a layer a foot or two or three deep in the soil, often associated with a kind of hardpan. That is, the rain water has carried the salts d[illegible] and the evaporation has taken place at a lower level inside th[illegible] and the salts have accumulated there. But [illegible]he normal condi[illegible]he accumulation of the salts on the surfa[illegible]

The [illegible]MAN. We wi[illegible]o hurry [illegible]. This is an important [illegible] there are [illegible]rs to co[illegible]

[illegible]NEY. I wo[illegible]ke to s[illegible]leaving this that, as of our e[illegible] carried [illegible] number of years in [illegible]tion with [illegible]a Exp[illegible]ation and on some of [illegible]clamation [illegible]e have [illegible] to determine approxi- [illegible]y the all[illegible]e of r[illegible]mportant field crops, and [illegible]e put ([illegible]m in [illegible]dable to the farmers, as a [illegible]rmers' [illegible] are [illegible]ir experiments now as to how th[illegible] th[illegible]ation to their water require- ment [illegible]

T[illegible] [illegible]ken [illegible]uction of certain [illegible]

[illegible]a good many. [illegible]with Egyptian cot- [illegible]

[illegible] cott[illegible]nd to be a compara- [illegible]p an[illegible] to the irrigated lands [illegible]rable to introduce this

type of cotton, in view of the fact that we import something around fifteen million dollars worth of it every year from Egypt. It enters into certain classes of manufacture that none of our American cottons fully satisfy. It is desirable from every point of view to produce a home supply in this country. As a result of our plant-breeding work we have developed one or two superior varieties of Egyptian cotton which are now being grown commercially in the Salt River Valley of Arizona. The crop of 1914 amounted to something over 6,000 bales and was valued at about $500,000. including the value of the lint and seed together. The industry is pretty well established there now.

Mr. HEFLIN. How much Egyptian cotton do we import?

Mr. KEARNEY. We have been importing during the last five years close to 150,000 bales. It averages about that annually. It has ranged from 100,000 to 200,000 bales during the last five years.

Mr. HELGESEN. What is the money value of the importation?

Mr. KEARNEY. It ranges from $10,000,000 to $20,000,000 a year.

Mr. HEFLIN. What is the difference between Egyptian cotton and sea-island cotton grown in southern Georgia?

Mr. KEARNEY. Egyptian cotton is not so long as our sea-island cotton. It is longer and finer than our ordinary American cottons. It ranges in staple from around an inch and five-sixteenths to about an inch and a half. Sea island, hardly any of it, falls below an inch and five-eighths.

Mr. CANDLER. Is the Egyptian cotton a white cotton?

Mr. KEARNEY. No. Most of the Egyptian cotton—in fact, all of it—has a more or less brownish tinge, ranging from a deep to a very pale buff.

The CHAIRMAN. That cotton is selling for how much now?

Mr. KEARNEY. The best grades of Egyptian cotton are selling at about 30 cents.

The CHAIRMAN. This is an industry the department has established in that country, is it?

Mr. KEARNEY. Yes.

Mr. CANDLER. How much South American cotton do we import into this country?

Mr. KEARNEY. I could not answer that question. That is something entirely out of my bailiwick. We do import some cotton from Brazil and Peru, but just what the amounts are I could not say offhand.

Mr. CANDLER. Do you know what the character of that cotton is?

Mr. KEARNEY. There are several different varieties of that cotton. One type of Peruvian cotton imported into this country is used very largely for mixing with wool.

The CHAIRMAN. The next item is breeding and culture of pomegranates.

Mr. KEARNEY. This is a small project, which originated through the discovery that the pomegranate is a fruit tree which is peculiarly resistant to alkali. It probably stands more alkali than any other cultivated fruit tree except, possibly, the date palm. It is a fruit that is culiarly adapted to the Southwestern States. It is a refreshing a ateful fruit for summer use, and we are developing its culture ly on the Indian reservations in the Southwest, the

Indians being especially fond of this fruit and growing very little fruit of their own at this time.

The pomegranate has small commercial value in this country. We import, perhaps, in the neighborhood of 100 tons a year, mostly from Spain. There is some demand for it in our eastern cities and in California. There is a small commercial production in certain localities in California already.

Mr. HELGESEN. What would that importation represent in dollars and cents?

Mr. KEARNEY. That would be hard to answer, Mr. Helgesen; it fluctuates so much from year to year. But I suppose the value of the fruit just now, laid down here, is something like $100 a ton, and we perhaps import a hundred tons of it.

The CHAIRMAN. Are there any other crops that you are hoping to introduce into this country?

Mr. KEARNEY. In connection with our drought-resistant plant-breeding project, we have developed strains of millet, sorgo and alfalfa suitable for dry-land agriculture in the northern-central Great Plains. We have a very early maturing and productive strain or sorgo, which seems to be well adapted to the climatic conditions there and which will ripen earlier than any variety now grown.

The CHAIRMAN. What is sorgo? What does it resemble?

Mr. KEARNEY. The term sorgo has been used recently by the department to designate the sweet sorghums as distinguished from kafir, milo, etc.

The CHAIRMAN. It is a kind of sorghum—it is a sweet sorghum?

Mr. KEARNEY. Yes, exactly; it is a sweet sorghum.

Mr. HAWLEY. It would be very interesting, it seems to me, and probably useful to us on the floor of the House, if we could have a list of the crops which the department has introduced and which have become commercially profitable in this country, giving the value of them annually and also the value of the crops upon which they are still working and the prospects for developing them.

The CHAIRMAN. Would it be possible to prepare such a statement, Dr. Taylor?

Dr. TAYLOR. In the course of a few days we could prepare a statement which would cover some of the more important features upon which we have a basis that would permit an approximate estimation.

The CHAIRMAN. Durum wheat, Eygptian cotton, and things like that; the more important introductions.

Dr. TAYLOR. Yes. We would be rather reluctant to submit a long guess, but on things where we have definite information we would be very glad to prepare such a statement and furnish it.

Mr. HAWLEY. The question is very frequently raised whether the money is being profitably expended or not.

The CHAIRMAN. Yes; I know. That would be very desirable if we could get a reasonably accurate statement. I would not want you to make a long-shot guess at some proposition which would subject the committee and the department both to ridicule at some time in the future.

Mr. HAUGEN. Can you include the amounts expended on each project?

Dr. TAYLOR. Yes, sir; we can do that also.

STATEMENT OF DR. H. B. HUMPHREY, PATHOLOGIST IN CEREAL INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Mr. Helgesen, gentlemen, desires to ask a few questions of Dr. Humphrey in respect to some rust work. I would ask the committee not to open up the subject entirely, because we must get along.

Mr. HELGESEN. Dr. Humphrey, I understand that you are in charge of the rust problem?

Dr. HUMPHREY. Yes, sir.

Mr. HELGESEN. Can you tell the committee what your experience has been with black rust, in destructiveness and its character generally.

Mr. LEE. In wheat, you mean?

Mr. HELGESEN. Yes.

Dr. TAYLOR. This is in item 86, which was discussed yesterday.

Dr. HUMPHREY. The black rust is merely one phase of the wheat rust, as we understand it, and is generally regarded as the most destructive phase of that parasite. The severity of an epidemic of black rust seems to be largely a matter of climatic conditions that may obtain during the growing season, of course. In some years, such, for example, as two years ago, the epidemic of black rust covered a pretty wide space throughout certain sections of the country. Two years ago it was very severe in the Dakota and Montana section.

And then there may be a period, we will say, of three or four or possibly five years, or even more, when an epidemic of black rust will not occur. There may be some black rust in the country, but the amount of damage caused by it is negligible. In years such as that of 1914 (the summer of 1914) it would be indeed difficult to estimate the very great damage that resulted from that epidemic, but unquestionably it would run into the millions. Certain varieties of wheat were practically totally destroyed by this rust; certain varieties were more or less resistant, and certain other varieties were entirely resistant. But, generally speaking, the damage resulting from black rust in the summer of 1914 was somewhere near 40 per cent, and especially is that true of the common bread wheats.

Mr. HELGESEN. It is the varieties of wheat from which we get our main crop which are most attacked?

Dr. HUMPHREY. Yes.

Mr. HELGESEN. And the wheat fields that are a little late in maturing are generally the ones most severely affected?

Dr. HUMPHREY. They are the ones that are easily caught; yes. I was in South Dakota two years ago, in July, at the time the fields were turning yellow, and I visited in three counties something like 25 wheat fields in which I took pretty careful notes of the condition of the grain and before the black rust epidemic at that time. On, I think it was, the 18th of July (it may have been a little bit before that, but the date does not matter in this case), I found very little evidence of black rust, and the prospects were for a very good crop of wheat. Three days after I was there—in fact, while I was there—it was raining a part of the time, and I understand that three days

after I left Watertown, S. Dak., these same fields that I had inspected were going down rapidly from black rust. Of course, the rust was already present in this grain; the red-rust stage had developed, and the black-rust stage followed immediately upon this when the conditions were suitable for its rapid development. That is what took place in this case. As a result, the yields in these fields were very low, and in some cases, a total failure.

Mr. HELGESEN. We have had experience in our State when it struck South Dakota, that it would travel at about the rate of 20 miles a day.

Dr. HUMPHREY. Yes.

Mr. HELGESEN. And when it strikes that part of the country where the crop is a little late and not so well matured whole sections become almost worthless.

Dr. HUMPHREY. That is true.

Mr. HELGESEN. This last summer I traveled down through the Red River Valley, and the wheat fields were pretty well ripe; but every field that was a little late was badly infected with black rust. One field which I noticed, where the man would have gotten about 40 to 50 bushels to the acre, was in a fortnight, as near as I could understand, not worth cutting. We have had crops absolutely wiped out in that way. What remedy have you, if any, or what is the prospect of any?

Dr. HUMPHREY. It is a most difficult problem to work upon, for the reason that the organism, the parasite, that causes the black rust is an internal parasite; it is within the tissues of the host, and we can not, therefore, apply successfully any spray solutions that will materially affect it.

Mr. HAWLEY. Where does it originate; in the leaves or in the stalk?

Dr. HUMPHREY. From spores. We have found certain wild grasses which bear certain intimate relations to epidemics of black rust.

Mr. HELGESEN. You do not think it is carried by the seed wheat itself?

Dr. HUMPHREY. There is some reason to believe it is, and we have a man at the present time working on that very phase of the problem. It would take but a very little, you see, of inferior seed in a bushel of grain for them to originate, we will say, centers of infection for every square rod of a given area, and it takes only a few centers of infection to get this thing started.

Mr. HELGESEN. They seem to multiply awfully fast?

Dr. HUMPHREY. Yes.

Mr. HAUGEN. I understood you to say that was due to climatic condition?

Dr. HUMPHREY. The climatic conditions affect the growth of this parasite.

Mr. HAUGEN. In our section of the country we have had black rust for 25 years, and it is believed that it was due to the heavy dew followed by hot winds. What would you say as to that?

Dr. HUMPHREY. Of course, I do not know what the effect of the hot winds is. I do not think the wind has so much effect upon it.

Mr. HAWLEY. The hot wind may scatter the spores?

Dr. HUMPHREY. Oh, yes.

Mr. HAUGEN. Generally, it makes its appearance immediately after the hot winds.

Dr. HUMPHREY. The germination of the spore takes place under conditions of moisture, and we have found from our experiments that germination of the spores takes place, we will say, early in the morning when the temperature is fairly low and when everything is laden with dew. Those are the conditions that conduce to infection. The parasite then enters the leaves of the host, or of the wheat plant——

Mr. HAUGEN. And the stem?

Dr. HUMPHREY. And the stem.

Mr. HELGESEN. What its characteristics are I do not know, but I do not think it is the wind——

Dr. HUMPHREY. The wind may have something to do with it.

Mr. HELGESEN (continuing). Because, if we have damp weather and no wind it will still travel 20 miles a day.

Dr. HUMPHREY. That is, no perceptible wind. It does not take much of a breeze to blow these microscopic spores; they may be carried a great distance with just a little puff of air.

Mr. HELGESEN. Day before yesterday we were given figures on a rust which you say is more destructive than black rust.

Dr. HUMPHREY. Yes; in Europe its damage is greater than in this country, and it is more to be feared.

Mr. HELGESEN. If it is, God knows what will happen to the wheat-raising section of the country.

Mr. STEELE. Along about 20 or 22 years ago, did not Frank Peavey discover that rust might be prevented by submerging the seeds in some kind of a solution?

Dr. HUMPHREY. You are thinking about smut now, because this does not have any effect on the rust.

Mr. HELGESEN. We have treated all of our seed in the last 30 years, and that does not have any effect on it.

Last year I asked you if you could not do this work more rapidly if you had more help, and you said you thought you could: but nothing was done about giving you an additional appropriation. With the addition of this very destructive rust that has been brought into this country, do you not think it would be wise to do a little more work on that—to work more rapidly?

Dr. HUMPHREY. I do, indeed. I think we could spend that money very advantageously.

Mr. HELGESEN. Would $5,000 do any good?

Dr. HUMPHREY. $5,000 would just about cover that phase of the work at the present time. I might say that this new rust is confined to the Pacific Coast States and to the intermountain region.

Mr. MCLAUGHLIN. What do you call it?

Dr. HUMPHREY. It is called "golden rust," but it really should be known by a better name, I think, as "stripe rust," because that word "stripe" designates it exactly.

Mr. HELGESEN. The black rust breaks out on the stem of the straw and looks for all the world like a lot of flyspecks. If you run your fingers up the straw, you can feel the roughness. It looks like flyspecks; and this other, you say, has a striped appearance?

Dr. HUMPHREY. This new disease, as far as we know, has not come farther East than the Gallatin Valley, Mont., where it is pretty severe. They have had it in Sherman County, Oreg., where the rainfall has averaged for the last 10 years something like 10 inches. The conditions that conduce to an epidemic of this rust are apparently different from those which must prevail in order to produce an epidemic of black rust.

Mr. HAWLEY. Does it attack fall wheat as badly as spring wheat?

Dr. HUMPHREY. Yes.

Mr. HAWLEY. Is the black rust as destructive on the fall wheat as on the spring wheat?

Dr. HUMPHREY. The black rust probably has been, in the United States, chiefly a spring-wheat problem, although it does attack winter wheat.

The CHAIRMAN. You say you think you could use $5,000?

Dr. HUMPHREY. We could use $5,000 very advantageously.

The CHAIRMAN. For the black rust?

Dr. HUMPHREY. For the black rust, and also $5,000 for the stripe rust.

The CHAIRMAN. You mean $10,000 in all?

Dr. HUMPHREY. Yes; $10,000 in all.

The CHAIRMAN. How would you use that money; for the employment of other specialists?

Dr. HUMPHREY. The $5,000 for the black rust is intended for the construction of a control greenhouse. For example, one of the important phases of our work at the present time is breeding rust-resistant wheats, and we have under way what I consider is one of the most important projects in the Bureau of Plant Industry, namely, the breeding of these resistant wheats. We do not know all of the conditions that make for resistance, and in order to find those out we must grow our plants, our experimental plants, under conditions that are under absolute control so far as moisture and temperature and soil conditions are concerned. At the Minnesota station this summer some interesting experiments were begun as to the effect of the addition of certain fertilizers to the soil and the effect of these fertilizers upon the appearance of black rust; and the result of these experiments has led us to believe that there is a point of attack that may lead to something interesting in the way of controlling this disease. Now, in order to study the effect of soil conditions, we have got to control all of the other conditions, you see, in order to say that such and such an effect is due to the presence of acid phosphates, or potassium salts, or of nitrates in the soil.

The CHAIRMAN. First you want $5,000 for the building of a greenhouse?

Dr. HUMPHREY. Yes.

The CHAIRMAN. For the purpose of making experiments with reference to fertilizers, and so on?

Dr. HUMPHREY. Exactly.

The CHAIRMAN. And next you will use the other $5,000 for the employment of field men?

Dr. HUMPHREY. No; for the employment of a man, stationed preferably at Corvallis, Oreg., to carry on the study of this new rust, the stripe rust.

Mr. HAWLEY. Have you found any means of controlling stripe rust as yet?

Dr. HUMPHREY. Not in this country. Of course, it is new to us.

The CHAIRMAN. With that $5,000 you would employ just one man to investigate that disease?

Dr. HUMPHREY. We would employ just one man out of that.

The CHAIRMAN. And that would cover his traveling expenses?

Dr. HUMPHREY. Yes; and necessary equipment for carrying on the work at that station.

The CHAIRMAN. Buying instruments, and so on?

Dr. HUMPHREY. Buying the instruments and providing for travel.

Mr. HELGESEN. As I understand it, you would put one of these greenhouses on the Pacific coast and one in——

Dr. HUMPHREY. No; only one greenhouse for the black-rust work. The location of that would have to be decided, but the work would be done preferably in Washington.

Mr. HELGESEN. You said the disease would have to be experimented upon under controlled climatic conditions?

Dr. HUMPHREY. Yes; but if a greenhouse is used, it does not make any difference where that greenhouse is, so far as the climate is concerned.

Mr. HAUGEN. To what extent does black rust affect the yield of wheat?

Dr. HUMPHREY. It depends, of course, on the severity of the epidemic. I might say that in 1914 we estimated the probable loss due to black rust as somewhere around twenty-five to thirty million dollars.

Mr. HAUGEN. $25,000,000 to $30,000,000?

Dr. HUMPHREY. $25,000,000 to $30,000,000. That is a conservative estimate. It may have been much more than that.

Mr. HELGESEN. It has been more destructive than that in our State alone. It has run all the way from 25 per cent up to a total loss.

Dr. HUMPHREY. Yes.

Mr. HAUGEN. I believe the estimate for North Dakota (I do not remember exactly the year) was half of the crop, estimated 25 bushels to the acre. That was true in our State in 1878, in which year it affected the crop produced in our State more than one-half.

Mr. HELGESEN. Just one more question. Dr. Taylor, you are at the head of this bureau. Do you indorse this additional appropriation?

Dr. TAYLOR. I would say, Mr. Helgesen, that this is not provided for in the estimates, and I would also say that these estimates represent the net remainder after a very close scrutiny and squeeze-out of all that it was regarded as possible to defer until a later time. I feel that the amounts that have been suggested could very effectively be used upon this important problem, but they are not included in the estimates.

The CHAIRMAN. Let me ask that general question. I do not suppose there is an item in your whole bureau where some additional money could not be used with profit: is that true or not?

Dr. TAYLOR. I think that is a true statement.

The CHAIRMAN. And these estimates represent what the bureau chiefs, the men in charge, and the Secretary, after thorough consideration, have regarded as appropriate for expenditure?

Dr. TAYLOR. Yes, sir.

The CHAIRMAN. I mean as to the value of the item, the value of the work, the weight of the work, and so on.

Dr. TAYLOR. Yes.

The CHAIRMAN. We will take that up and consider it when we come to it.

Mr. HAUGEN. Just one question: Doctor, is it not a fact that the money expended for the study of diseases with relation to the more important crops has been very small, as compared with the amount of money expended for the study of the minor crops—that is, considering their intrinsic value?

Dr. TAYLOR. I think it is true, in general, that the amount of money expended upon the staple crops in proportion to their value and the importance of the staple crops is less than has been expended upon the minor crops. This is basically due to the fact that the staple crops in general are better understood, and therefore their problems have not been regarded as acute as in the case of the new crops. But it is a fact that the general situation is as you state, Mr. Haugen.

Mr. HAUGEN. Corn, of course, is the largest crop intrinsically in the United States. The amount of money expended for the investigation and study of corn is not much more, if any, than it is for some of the smaller crops, as, for instance, fruits and various small crops which aggregate about $25,000,000 in value?

Dr. TAYLOR. I think that is true.

Mr. HELGESEN. Mr. Chairman, I do not want to have any misapprehension as to this——

The CHAIRMAN. I understand your enthusiasm, Mr. Helgesen.

Mr. HELGESEN. I do not want to have it considered as enthusiasm for something that is not of vast importance.

The CHAIRMAN. I think it is of vast importance, from the statement of Dr. Humphrey.

Mr. HELGESEN. For instance, if you had a cotton crop wiped out after you had gotten it to a point where you had as fine a stand as you ever had and expected a bumper crop, as we have had with wheat, and in two or three weeks you had nothing, you would begin to realize what this means to the whole United States.

The CHAIRMAN. And we would be going after it pretty hard, too.

Dr. HUMPHREY. I would like just to pass this picture around. It illustrates the results of some of our breeding work. There are three groups, side by side, represented on the picture. The one in the middle represents a hybrid which has been produced by crossing durum and one of the common wheats. The common wheat is the bearded fife and the other is durum. You will notice that group of straws in the middle carried very much less black rust than the common wheat and a little more than is carried by the durum. The durum, in fact, is possibly absolutely clean. But it is an interesting picture, which shows what can be done by crossing.

Mr. HAUGEN. Have you discovered any other rust-resistant plants up to this time?

Dr. HUMPHREY. No; we have not discovered any other rust-resistant plants. We have a few hybrids started, and we are going to improve those from the seed.

STATEMENT OF DR. C. O. TOWNSEND, PATHOLOGIST IN CHARGE OF SUGAR-BEET INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Take up item 90, for sugar-beet investigations.

Dr. TAYLOR. Item 90, for sugar-beet investigations, estimates the same amount as for the current year. This total of $41,495 includes a proviso of $10,000 for investigations in connection with the production of table sirup, including the breeding, culture, and diseases of cane, and so forth. I would say, in explanation of this, Mr. Chairman——

Mr. MCLAUGHLIN. Is that the same amount that has been carried before?

Dr. TAYLOR. Yes; the identical amount. I would say that the work carried on in previous years has been done jointly by the Bureau of Chemistry and the Bureau of Plant Industry, certain phases being prosecuted by the Bureau of Chemistry, to the extent of $4,000 this year, and the remainder by the Bureau of Plant Industry, to the extent of $6,000. Dr. Townsend supervises all of the plant-industry work under the subappropriation and will discuss it.

The CHAIRMAN. You may proceed, Dr. Townsend.

Dr. TOWNSEND. The work of this office, as Dr. Taylor has stated, is divided into two classes—sugar beets and table sirup. Under the sugar-beet investigations we have outlined three projects. We have made these projects as broad and general as possible, in order to include all of the factors which bear upon sugar-beet production, including cultural methods, diseases, labor, markets, etc. The first and second projects are somewhat similar; therefore we are carrying them on together. One is a survey of the sugar-beet sections or areas in the United States and the other is a survey of the individual farms. The sugar-beet sections where sugar mills are in operation extend from Michigan and Ohio in the east through to the Pacific coast and the Southwest to southern California and Arizona. Seventeen States are embraced in this survey work, including Arizona, which has one factory that is now being used largely for the manufacture of sugar from cane.

The CHAIRMAN. What do you propose to develop by this survey—the areas in which the sugar beet may profitably be grown?

Dr. TOWNSEND. That is one of the particular problems. Primarily, we started out with the idea of first determining in which of these sections where the sugar beet is now grown it can be grown profitably—that is, whether or not it is a part of the legitimate agriculture of those sections. The second idea in mind was to determine what sections not already engaged in the growing of sugar beets may bring in the sugar-beet crop as one of the legitimate factors in the agricultural operations of those sections. We aim to follow these surveys with demonstration work covering disease-control methods, cultural methods, and all other limiting factors in sugar-beet culture.

Mr. MCLAUGHLIN. Can you state briefly what kind of soil is suitable for the sugar beet?

Dr. TOWNSEND. The loamy soils are preferred; either a sandy loam or a clay loam. But in general any soil that will produce

good yields of other crops will produce sugar beets. We try to avoid extremely sandy soils, and we also like to leave out those soils which have a gravelly subsoil, because they dry out too quickly and generally produce small yields.

Mr. McLAUGHLIN. Is it found desirable to have particular ingredients, you might say, in the soil?

Dr. TOWNSEND. Certain ingredients are necessary, but the soil, I might say, is not nearly as important a factor as climate in the production of sugar beets. We say that for the reason that we are not able with certainty to produce sugar beets sufficiently rich in sugar for sugar-making purposes in the southern part of the United States. We can grow sugar beets there and get good tonnages, but we can not, for some reason, always get high sugar content. That seems to be controlled very largely by climatic factors.

Mr. McLAUGHLIN. Generally speaking, is that because they lack the alternate climatic conditions of temperature—the cold nights and warm days—at the time of year when the sugar gets into the beet?

Dr. TOWNSEND. Yes, sir; we think that is true. And, further than that, it seems that a large part of the sugar that is made in the warm climates is converted into nonsugars by the extremely hot weather before it is extracted from the plant. But that feature which you mention is one of the important ones. We find, while the beets begin in the very early stage of their development to take on sugar, that the largest amount of sugar is stored up in the fall, when there are the greatest extremes of temperature between night and day. That fact is pretty well settled.

There are a great many factors that we are considering in our survey work besides soil and climate. We go into a section to determine whether or not the sugar beet will do well in that section. The first thing is to consider the topography of the country. If it is an extremely hilly country, it would be left out so far as sugar-beet growing is concerned. After determining the question of the topography of the country, we take up the soil and determine whether the general soil conditions are suitable for beets, and then the question of the general climatic conditions. Then we get down to the more individual local problems of equipment, competing crops, labor problems, and the marketing phase of the work. And right in there comes the question of road conditions. We note whether the roads are hilly, whether the roads are hard, whether they are sandy; all of those things are factors that bear upon the general sugar-beet situation in the various sections.

The farmer, in order to produce and deliver a good crop of beets profitably, must have good roads, and the condition of the road will limit the distance from the sugar mill or from the loading station that the farmer can operate a sugar-beet farm successfully. We have found, in general, that a 4 or 5 mile haul is about the limit under ordinary conditions, but beets have been hauled over certain roads for distances of 8 or 9 miles with profit to the grower. But, as I say, those are local questions and conditions that we must consider in settling this problem of proper sugar-beet areas or localities.

Mr. STEELE. While you are on this problem of the roads in connection with the production of beets, etc., it is a well-known fact that Norfolk, Nebraska, and that country around there is well

adapted to the raising of sugar beets. Oxnard had a large plant there. Do you know why he discontinued and moved his plant up into Utah?

Mr. HOWELL. No; not into Utah.

Mr. STEELE. Where did he move it?

Mr. HOWELL. I do not know.

Mr. STEELE. He took it away. The point is that it was impossible in that country to get help. As I understand, the sugar beet has got to be hand weeded.

Dr. TOWNSEND. Yes, sir; and hand thinned.

Mr. STEELE. Our farmers, while they went into it and entered into contracts for, I think, about two years, gave it up because they could not get the cheap help to hand weed the beets. While it was profitable to raise them, and there was enough saccharine in the beets to produce good sugar, Oxnard had to remove his entire plant because he could not get the help. Our people just could not afford to raise them.

Mr. MCLAUGHLIN. It is more of a gardening proposition than a farm proposition?

Dr. TOWNSEND. It is an intensive-farming proposition, and there must be a certain amount of hand labor performed just at the right time in order to make the work a success. In the manner in which the beet industry is worked out in this country the sugar companies have generally undertaken to provide this labor for the farmer; and if they do not get it at the right time, their beets will not yield as large a crop as they would otherwise. And so the farmers get discouraged and stop growing the beets because they can grow other crops with greater profit. The result is that there are not beets enough to operate the mill, and the mill has to change its location. I presume that is the reason for the change in the Norfolk section. I have been there many times and am familiar with the climate and the soil.

And right there, let me say that one of the factors in the growing of sugar beets is the mental attitude of the farmer toward this work. If he gets discouraged by reason of not having sufficient labor or because of the prevalence of beet diseases or for any other reason, he is going to stop growing beets just the same as he will stop growing any other crop and grow something else when he can not grow that particular crop with profit to himself. I may add that the grower is always at liberty to provide his own labor.

Mr. HOWELL. Approximately what acreage in the United States could be devoted to the successful growth of sugar beets?

Dr. TOWNSEND. I estimate we might easily have four or five times as large an area devoted to sugar beets as we now have. We have, at the present time, something over 70 sugar mills. These require an average of about 10,000 acres per mill. There are areas that might be devoted to sugar beets where sugar beets are not grown—throughout the North and Northwest. For instance, while Michigan has 15 sugar mills, Ohio has only 5, Indiana has but 1, Wisconsin 4, and only 1 of the Wisconsin factories was operated last year.

Mr. MCLAUGHLIN. Is there any question that we would have area enough to produce all of the sugar that this country needs if the industry were to develop to its full extent?

Dr. [illegible]. I think not. We are producing now in this country [illegible] cent of our sugar in continental America; that is,

of the amount we are consuming about 21 per cent is being produced in this country. About 23 or 24 per cent is being produced in the so-called island possessions of the United States—Porto Rico, Hawaii, and the Philippines—and something over 50 per cent is imported from Cuba at the present time.

Mr. HAWLEY. Twenty-one per cent is produced in this country. Does that include cane sugar as well as the beet sugar?

Dr. TOWNSEND. Yes, sir.

Mr. HAWLEY. What proportion of it is beet sugar?

Dr. TOWNSEND. For a number of years it was about half and half, but at the present time the larger proportion is beet sugar. Over 800,000 tons is beet sugar and about 160,000 tons cane sugar.

Mr. STEELE. Then, the reason the sugar beet has not kept its own and increased is because of the price of labor; is not that the real truth?

Dr. TOWNSEND. That, of course, is one of the factors. Still, labor for that kind of work is just about the same now that it was at the beginning of the industry. It is contracted for at the beginning of the season and runs from $18 to $20 per acre.

Mr. STEELE. Here is what I want to get at: Oxnard, as I remember it, imported a great many Austrian families to do this work for the farmers.

Dr. TOWNSEND. Yes.

Mr. STEELE. But the farmers gave them more for their services and they quite working for the sugar-beet companies and went to work for the farmers, and they rented farms and left the beet fields bare. It seems there was employment for them at higher wages. Now, Oxnard had contracted with them to do this work.

Mr. MCLAUGHLIN. I think you will find that a great deal of the labor of children and women is used in some of the sugar-beet fields.

Dr. TOWNSEND. In the thinning; yes, sir.

Mr. STEELE. Oh, yes; that is true.

Mr. MCLAUGHLIN. They are able to do that kind of work and can not do the harder and heavier labor of the ordinary farms?

Mr. STEELE. Yes; but you do not meet those children out in the country.

Mr. MCLAUGHLIN. I am not sure I understood what you said a moment ago. Did you say it is doubtful whether there is area enough in this country suitable for growing the sugar beet sufficient to supply our domestic demands?

Dr. TOWNSEND. No, sir; I say there is no doubt about it.

Mr. MCLAUGHLIN. Perhaps you remember what Secretary Wilson said about the quantity of land in Michigan suitable for growing sugar beets?

Dr. TOWNSEND. Yes; and somebody in California said that there was sugar-beet land enough in California alone to produce annually all the sugar that the United States would need. Of course, our sugar consumption is increasing from year to year, and in the past 20 years it has increased 35 pounds per capita. Taking this fact into consideration, the development of the beet-sugar industry to its present proportions has not diminished the importation of sugar.

Mr. MCLAUGHLIN. Are you increasing materially the sugar content?

Dr. TOWNSEND. We are increasing the sugar content, and we are also increasing the tonnage by the work that we are doing. This increase does not appear in the reports of averages, but when we take the individual sections which have been in sugar beets for a series of years, like the old sections of Utah, where sugar beets have been grown so long, we find the tonnage there even exceeds the tonnage in Germany. The smaller yields in the newer beet sections tend to keep the average down.

Mr. MCLAUGHLIN. Can you give us some figures showing the increase of sugar content in beets, as the years have gone by, as a result of your work?

Dr. TOWNSEND. The increase in the sugar content of the beet is due very largely to the adaptation of the beets to our climatic conditions and to improved cultural methods. In general, we may say that the increase has been about 2 per cent of sugar in the beets.

Mr. MCLAUGHLIN. From what figure?

Dr. TOWNSEND. From a fraction over 12 to a fraction over 14 per cent, as a general average, is my recollection offhand for those figures.

Mr. OVERMYER. Is granulated sugar an exclusively beet sugar?

Dr. TOWNSEND. No; both beet and cane.

Mr. OVERMYER. Is there a difference in the sweetening properties of cane granulated and beet granulated sugars?

Dr. TOWNSEND. No, sir; not when they are properly refined. They are just the same.

Mr. OVERMYER. I notice this difference: We have a beet plant at my home city—Fremont, Ohio—and we use a great deal of the product there, and it has a very high sweetening property. We must use twice the quantity of the sugar we buy here in Washington to get the same results in sweetening properties.

Dr. TOWNSEND. There is a difference of opinion in regard to that; but, strictly speaking, when we come right down to a scientific basis, there is no difference between refined beet sugar and refined cane sugar. They are identical in composition. Of course one might dissolve a little more quickly than the other, and in that way——

Mr. OVERMYER. They might release the saccharine quicker?

Dr. TOWNSEND. Yes.

Mr. HAUGEN. There is a difference in price, is there not?

Dr. TOWNSEND. Yes.

Mr. HAUGEN. Why do they make that difference?

Dr. TOWNSEND. That is a trade proposition that I have not investigated.

Mr. HAUGEN. Does the beet sugar sell for less?

Dr. TOWNSEND. Yes; beet sugar sells for less than cane sugar.

Mr. HAUGEN. In all sections of the country and at all times of the year?

Dr. TOWNSEND. So far as I know; yes. So far as I have followed that phase of it that seems to prevail. I could not say definitely, because I have not gone into it.

Mr. HAUGEN. I understand you to say that there are four mills in Wisconsin. Can you give the number throughout the United States?

Dr. TOWNSEND. There were 66 sugar mills in operation last year. There are, if I remember correctly, 76 factories standing at the present t . .

Mr. McLAUGHLIN. And 66 operating?

Dr. TOWNSEND. Yes. More operated last year than the year before.

Mr. OVERMYER. That is true, I know, in Ohio, because the Fremont plant was closed in 1914 and it reopened in 1915.

Dr. TOWNSEND. Yes.

Mr. HAUGEN. Was that due to the increased price paid for labor, or to what do you ascribe that?

Mr. McLAUGHLIN. The higher price of sugar; it is more profitable to make now than it was a year ago.

Dr. TOWNSEND. To the higher price of sugar.

Mr. HAUGEN. Can you give us any reason for those 10 factories being idle? Have you investigated that matter?

Dr. TOWNSEND. There are a number of reasons why some of those factories are idle. For instance, one is idle because the curly-top disease struck the beet fields three or four years in succession, and the farmers refused to grow beets because they could not get a profitable crop. In another section they had the root rot pretty badly and the factory closed. In another section the land was not properly leveled for irrigation. The people wanted to know why they could not raise sugar beets and we told them the ground was not properly leveled. It left some of the beets high and dry, while others were drowned out. Those factors and other local conditions mainly closed the factories that are closed at the present time.

Mr. HAUGEN. Does that apply to all of them?

Dr. TOWNSEND. So far as I recall right now.

Mr. McLAUGHLIN. We used to get most of our beet seeds from Germany?

Dr. TOWNSEND. Yes, sir.

Mr. McLAUGHLIN. And we thought it was necessary to do so?

Dr. TOWNSEND. Yes, sir.

Mr. McLAUGHLIN. But lately the American interests are taking up the work of producing beet seed in their proper and scientific way. Can you tell us what progress they are making?

Dr. TOWNSEND. That is the third project.

Mr. McLAUGHLIN. That will come later?

Dr. TOWNSEND. That will come later; if you are through with the first and second projects, we can take up the question of beet seed now.

Mr. HAUGEN. Mr. Chairman, may I ask one or two questions?

The CHAIRMAN. Yes.

Mr. HAUGEN. Have you gotten far enough along to estimate the cost of producing beets; I mean under average conditions?

Dr. TOWNSEND. We are getting some figures on that this year. I may say we have made surveys of approximately 2,000 individual farms and we have a large force at work on that data now, and we will have, shortly, some very accurate data as to the cost of producing sugar beets on those farms as compared with other crops and the general relation of sugar beets to the other crops and live-stock interests on the same farms. This work is done in cooperation with the Office of Farm Management.

Mr. HAWLEY. Were those farms selected from all parts of the United States?

Dr. TOWNSEND. Yes; there were some surveys in Michigan and some in Colorado, Idaho, Utah, and California. We expect to continue this work this year and to carry back some of the information to the same farmers we worked with last year.

Mr. HAUGEN. Have you any estimate as to the cost of the production of the beet sugar?

Dr. TOWNSEND. Of the sugar itself?

Mr. HAUGEN. Yes.

Dr. TOWNSEND. As far as I recollect, the cost of producing sugar is approximately 2½ cents a pound. Of course, that is such a variable thing that I hesitate to attempt to give definite figures.

Mr. HAUGEN. You have gone into it sufficiently thoroughly so that you can give an estimate?

Dr. TOWNSEND. I have gone into it so thoroughly that I am doubtful of being able to give accurate figures. [Laughter.] I hesitate because there are so many factors entering into the manufacture of sugar, from the time the beet seed is purchased in Europe until the sugar comes out of the drier and runs into the bag. There are so many, many factors that no two batches of sugar cost the same. You might say, almost, that no two pounds of sugar cost the same to produce. Therefore, to say it costs so much to produce a pound of sugar is very uncertain.

Mr. HAUGEN. Doctor, that is true, I think, with every product that comes from the farm. Yet we have estimates every day from experts, and we are grateful for the information.

Dr. TOWNSEND. Yes, sir.

Mr. HAUGEN. Now, what I was interested in knowing is the cost of producing the beets. I have reference now to the production of beets on the farms in the country under average conditions. The labor conditions are practically the same, as I understand: labor is paid per acre for weeding and for harvesting the crop. Have you estimated the cost of manufacturing beet sugar in the United States?

Dr. TOWNSEND. There are two questions there, as I understand it. One is the question of producing the beet, so far as the farmer is concerned.

Mr. HAUGEN. That is one.

Dr. TOWNSEND. Then, the other is the producing of the sugar, so far as the sugar maker is concerned.

Mr. HAUGEN. Yes. Have you given that any study?

Dr. TOWNSEND. I have given that a great deal of study.

Mr. HAUGEN. And you have reached the conclusion that estimate can not be given?

Dr. TOWNSEND. As I say, the estimate for producing the sugar is, roughly, 2½ cents a pound. The cost of growing beets is estimated all the way from $30 to $60 an acre, depending upon the yield and conditions, which are varied. Our survey, when completed, will give us some accurate data in regard to this profit.

Mr. HAUGEN. In the estimate of 2½ cents a pound, did you take into consideration the price paid for beets; or is that the cost to the manufacturer, outside of the payment for the beets?

Dr. TOWNSEND. That is the cost of the sugar in the beet.

Mr. HOWELL. At the instance of the President of the United States it was given out that an investigation of the beet-sugar industr

with reference to the cost of making sugar was undertaken. Was that under your bureau directly?

Dr. TOWNSEND. No, sir; that was in the Department of Commerce.

Mr. HOWELL. To your knowledge, has the report of that investigation ever been made?

Dr. TOWNSEND. It has not been published, so far as I know.

Mr. HOWELL. I have been trying to get a copy of the report, but have not been able to find out anything about it either from the Department of Commerce or from your department.

Dr. TOWNSEND. The Department of Commerce would have to give you that information; we had only to do with that incidentally.

The CHAIRMAN. Take up your sugar-beet seed production work.

Dr. TOWNSEND. The sugar-beet seed production is a very interesting and important problem. As Mr. McLaughlin stated a few minutes ago, the beet seed formerly was all brought from European countries, but in recent years the growing of beet seed in this country has been taken up and is now assuming quite important proportions. This last year beet seed was produced commercially in Michigan, Colorado, Montana, Idaho, Utah, California, and Arizona. But with all of the seed that is produced in this country we are growing now less than one-sixth of the amount that is needed to plant the acreage that we have in beets at the present time, to say nothing about the possible extension of the industry.

Mr. MCLAUGHLIN. Did you ever have an opportunity of visiting Germany to see their seed-producing plants and processes and so on?

Dr. TOWNSEND. I was over in Germany quite a number of years ago, but I was not at that time especially interested in the beet-sugar industry and did not get as much information, first hand, as I wish I had in regard to that. But I have a pretty general knowledge of the methods used in that country.

And here is an interesting fact in regard to our own beet seed: That we can produce in this country seed that is just as good as the imported seed, and better in one respect; that is, in regard to germination. We estimate, and the estimate is based upon fact, that about 12 pounds of our home-grown seed will give just as good a stand as 18 or 20 pounds of imported seed.

Mr. MCLAUGHLIN. How about the value of the sugar content?

Dr. TOWNSEND. The tonnage and sugar content are just as good, so far as our investigations go.

Mr. MCLAUGHLIN. That is a very interesting statement, in view of the immense care taken and the expense incurred in Germany in producing seed for their own use and for importation into this country. I had a very full explanation or detailed statement made to me by a gentleman who had investigated conditions over there, and it is wonderful the care that is taken in producing their beet seed, and the length of time that it has taken to do it. It goes through seven or eight years—seven or eight generations, I believe.

The CHAIRMAN. And that is the answer, Mr. McLaughlin, to a great many critics of certain kinds of investigational work in the Department of Agriculture: That oftentimes you can not do this scientific work in a day, a month, or a year, or even in 10 years.

Mr. MCLAUGHLIN. Of course, every beet, I suppose, will produce seed, and the seed can be produced in this country each and every

year. But I was interested to know whether that seed that was pr duced, you might say, offhand, without this great care and cultivatic and the scientific methods employed in Germany was as good as tl seed produced as the result of all that work and expense in German

Dr. TOWNSEND. It is giving us just as good results. But we mu remember that the seed we are using to produce seed in this counti is the result of all those years of work and production.

The CHAIRMAN. Exactly. You have the benefit of their work ar experiments.

Dr. TOWNSEND. Yes; and we are gathering the results of that our seed yields. It costs from $1,000,000 to $1,500,000 a year for th country to import its sugar-beet seed at the present time.

Mr. HAWLEY. With regard to this seed that you import from Ge many, plant, and then replant: do you get just as good results aft four or five or six years as in the first year after it is produced?

Dr. TOWNSEND. We have not been carrying on the work in th way long enough to decide definitely. Most of the work done prev ously has been carried on by going back to Germany and importir the seed and planting that, knowing we always could get that seed start our seed beets from. Now we are starting to develop an Amer can strain of sugar-beet seed; but just how long that will take ar just what our results will be, of course, we are too young in tl work to say

Mr. HOWELL. Can the production of seed be carried on here profi ably, or is it carried on at the instance of the sugar companies?

Dr. TOWNSEND. So far the sugar companies have taken upon ther selves the commercial phase of growing the sugar-beet seed in th country; but there is no reason why it should not be carried on l good seedmen or, so far as that is concerned, under certain restri tions, eventually by the farmers themselves.

Mr. HOWELL. Is there not great danger of importing some diseas from Germany that affect the sugar-beet crop by being depende upon a foreign country for our seed?

Dr. TOWNSEND. There is some danger of that; but the only di ease that we seem to have gotten from Europe so far is the so-call nematode disease, which appears at certain points in the West.

Mr. HOWELL. What is that disease?

Dr. TOWNSEND. The nematode. That is the eel-worm; the litt eel worm disease that Dr. Cobb told you about the other day ar which we have found in several places in the West. So far as v can learn, it came with the sugar-beet seed, although we are not a solutely sure of that, for the reason that we have not been able find any live nematodes in the seed that has been imported.

The CHAIRMAN. Is there anything further? You are making interesting statement, but there is a limit to our time.

Dr. TOWNSEND. I am ready to go on, but I believe I have cover the ground.

The CHAIRMAN. Do you have the sugar-cane work?

Dr. TOWNSEND. Yes. I do not want to overlook that. Now, far as the sugar cane work is concerned, our office is at present i terested only in the manufacture and improvement of the table sir made from cane. That, of course, involves cultural methods, stud of varieties, control of diseases, and a study of the various facto that enter into the making of cane sirup. There are in this count

something over 268,000 farms on which cane is grown for the purpose of making cane sirup. About 86 gallons, on the average, are produced on each of those farms.

Mr. HAWLEY. Per acre or per farm?

Dr. TOWNSEND. Per farm. That is the average for the United States. Of course the average area of sugar cane for sirup-making purposes on the farm is small—less than an acre—but it is an important thing; and what appeals to us is that it is an individual farm proposition. These farmers on the cane-sirup making farms, as I understand it, consume large quantities of the cane sirup right at home. From one to two barrels per year is consumed by each sirup-producing family. Those barrels hold 33 gallons each. We are trying to improve this sirup, because the quality is seldom of the best as it is made on the individual farm at the present time. We hope to do this by improving the cultural methods and improving the varieties, of which we are now trying out about 10. We will have on our plats this year six new imported varieties, of which we have just a few hills. These we will develop as rapidly as possible, so as to make commercial trials.

We are also improving the methods of making the sirup. We have developed a steam evaporator which gives uniform heat and prevents the scorching of the sirup, makes a better quality of sirup, makes it in less time, and makes a more uniform product. One great difficulty in selling the surplus sirup these farms have is that they can not guarantee the quality. We hope to overcome that and to develop an inexpensive evaporator which will give, within reasonable limits, a uniform quality to this sirup—sirup that will be much better than that they have been using—so that, although the people probably will consume more at home, they will also have a better quality to sell.

This sirup has been bringing a price varying all the way from 28 cents up to 41 cents. I think with our experimental sirup we probably about topped the market the 1st of January, at the time we sold the bulk of what we had on our experimental field at Cairo, Ga., receiving forty-one and a fraction cents per gallon. The yield which we obtained this year in our experiments was about double that produced from the commercial fields on the same farms. We have attributed that largely to the deeper plowing and better tillage and, to some extent, the better varieties of seed cane used.

Mr. LEE. A very important feature of your investigation, I should think, would be the keeping quality of the sirup.

Dr. TOWNSEND. Yes.

Mr. LEE. For instance, I have understood that if you did not boil the sirup enough it would sour.

Dr. TOWNSEND. Yes.

Mr. LEE. And if you boiled it too much it goes to sugar.

Dr. TOWNSEND. Yes.

Mr. LEE. Are you making any study along that line?

Dr. TOWNSEND. Yes, sir; we are making a study along that line.

Mr. LEE. Are you meeting with any success?

Dr. TOWNSEND. Yes, sir; I think we are in a fair way to solve that problem. Dr. Yoder has that work in charge, and I am not quite sure how far it has progressed, but I have discussed it with him and feel sure that progress is being made along that line.

[illegible]

Mr. McLAUGHLIN. [illegible] I think the idea in the [illegible] was to establish a number of plants like [illegible] that the plant was not operated. This was started, how about the planting?

Mr. McLAUGHLIN. You did not take over the old plant then, or any of the material or such like?

Dr. TOWNSEND. The old plant was at that time still in the possession of the department, and I learn since it disclosed that fact that it was not for use in connection with such a project as this, as a demonstration project to operate and which would not justify its retention, and for that reason it was sold.

Mr. McLAUGHLIN. Are you working out the problem of whether or not it would be possible or profitable for the individual farmer or producer of cane to make his own sirup?

Dr. TOWNSEND. Yes, sir; that is our problem.

The CHAIRMAN. That is your project?

Dr. TOWNSEND. Yes, sir; that is our big problem, and we are meeting with success along that line.

The CHAIRMAN. I might say, Mr. McLaughlin, that a great many people in the community in which I was born and raised always have their little patch of cane, and there is a neighborhood mill to which they haul it and have made up probably 15 or 20 gallons, which is enough for their winter sirup. While it is not a big industry at all, it is one of those self-sustaining lines of work that I regard as more or less important.

Dr. TOWNSEND. And that is capable of considerable expansion.

The CHAIRMAN. Undoubtedly.

Dr. TOWNSEND. I would like to mention that and call the attention of the committee to the extent to which this might be extended and expanded with a better grade of sirup, a more uniform grade. From a careful study of the subject, I think the possible expansion is almost unlimited.

Mr. LEE. Do you know the number of gallons that are produced in the United States?

Dr. TOWNSEND. Somewhere in the neighborhood of 23,000,000 gallons—something over 23,000,000 gallons annually.

Mr. HOWELL. Do we import any sirup from other countries?

Dr. TOWNSEND. I am not sure; I can not answer that question.

The CHAIRMAN. We get some; I happen to know that. I think we get some from Jamaica, do we not?

Dr. TAYLOR. I think so, and some from Cuba.

It may interest the committee to know that, in connection with this sugar-beet seed growing project, during the last few weeks we have been most especially concerned because of the crisis that exists with reference to the adequacy of the seed supply for next year. As recently as two weeks ago it seemed doubtful whether a sufficient supply of seed would be available, as a result of the embargo upon

the exportation of beet seed established by the Austrian and German Governments, as well as by the activity of the opposing forces in preventing shipment across the ocean.

Mr. McLAUGHLIN. Was there not some correspondence between our State Department and that of Great Britain looking to the release of the sugar-beet seed so that it might be exported from Germany and brought in here?

Dr. TAYLOR. There has been a large volume of correspondence, both on paper and by wireless.

Mr. McLAUGHLIN. I mean on this particular matter.

Dr. TAYLOR. Yes. And recently, until two weeks ago it appeared doubtful whether it would be possible to move the last 15,000 sacks out of Germany, they having placed a time limit of January 20 upon that removal. The activity of the State Department and the sugar factories, coupled with the work of the Department of Agriculture, the Secretary agreeing to act as the consignee of that seed and to guarantee that it should not go outside of the United States, has resulted in the starting of the seed. The first shipment is now afloat, due to reach New York this week.

Mr. HOWELL. Did you say Germany and Austria had placed embargoes upon the exportation of beet seed?

Dr. TAYLOR. Yes, sir.

Mr. McLAUGHLIN. One would appreciate the importance and value of developing this sort of a producing industry in this country if he could hear, as I did a year ago, the story of a man who had visited these plants and farms and so on in Germany. It was one of the most interesting discussions of the production of what you may call an agricultural product that I ever listened to. There are farms over there that have been carried on for generations, producing nothing but beet seed, and it has been a process of breeding, breeding, breeding and selection covering years; and the most particular and painstaking methods, both scientific and practical, have been employed. It is most interesting.

Now, if that process must be gone through with to produce the seeds that we use, and if there is any danger at any time that the supply from the outside will be cut off, it may be very necessary for us to take up and develop that in this country.

Dr. TOWNSEND. Let me say, Mr. Chairman, that there is not beet seed enough in sight at the present time, either in this country or afloat, so far as we know, to supply our present mills that would like to operate in 1916; to say nothing of the possible development of the industry in the way of increased acreage and new factories if the seed were available.

Mr. McLAUGHLIN. All of you gentlemen should have the pleasure of meeting Mr. Hathaway, who is connected with some American beet-sugar industry—I do not know the corporate name of it. It would be well worth your while to have him tell you about this production of beet seed in Germany. It is one of the most interesting things I have ever heard.

(Thereupon, at 12.35 o'clock p. m., a recess was taken until 3 o'clock p. m.)

AFTER RECESS.

The committee reconvened at 2 o'clock p. m.

STATEMENT OF MR. FREDERICK V. COVILLE, BOTANIST IN CHARGE OF INVESTIGATIONS IN ECONOMIC AND SYSTEMATIC BOTANY, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. In the absence of Dr. Taylor, I will ask Mr. Kellerman to take up item 91. "For investigations in economic and systematic botany and the improvement and utilization of wild plants and grazing lands."

Mr. KELLERMAN. Mr. Chairman, I would suggest that, instead of following strictly the outline in the program of work, Mr. Coville, who is in charge of this work, be permitted to group his projects and outline in a general way the purpose of the entire work, and then call attention to two or three of the main features in the interest of economy of time. If that would be a satisfactory way to proceed, Mr. Coville is here, and he will take up this subject.

The CHAIRMAN. Very well, then, we will hear from Mr. Coville.

Mr. COVILLE. Mr. Chairman and gentlemen, our work of economic and systematic botany is carried on primarily to determine the identity of plants with which the Department of Agriculture has to deal. If a plant is suspected of being poisonous and is under investigation by the department, it is referred to our office, and there we first find out what the plant is; we establish its botanical identity. This question of the identity of a plant with which we are dealing, whether it is a drug or an alleged poisonous plant or a new weed, is quite as important in connection with the department's work as the identity of a prisoner before a court. When we have identified the plant, we have the key to everything that has been published about it. We get the record of its criminal history in botanical literature. The department is then in a position to determine with economy of time and effort whether the plant committed the particular offense with which it is charged. For the purpose of establishing the identity of these plants, we maintain a large herbarium and a large botanical library. We have paid a good deal of attention to equipping and keeping in good condition this herbarium and library. We have a special catalogue of all the books in the various libraries of Washington, including our own library, the Library of Congress, the National Museum library, the Surgeon General's library, and so on.

Without dwelling further on our general function, I may say that, as an outgrowth of this equipment and the expert knowledge which we have acquired in the utilization of that equipment—constituting, as it were, a sort of botanical encyclopedia of agriculture—we have developed certain other special lines of work. One of these is the acquiring of technical information regarding wild grazing plants. We are working out the life histories of these plants. Especially do we find out in the case of each important grazing plant the time at which the plant begins to send up its seed stalks and the time when the seed is ripe. We thus determine at what time the stock should be put on the land and the time when it should be taken off to reseed an overgrazed area by natural means. We have been able to enormously increase the stand of the best wild grasses on badly over-

grazed areas without closing the areas to grazing for a whole year and therefore without wasting the forage crop of a single season. By a proper system of management and proper handling of the stock, we have been able to increase the carrying capacity of the grazing lands inside the national forests by about 50 per cent.

Another piece of our work is the experimental cultivation of some few plants that are just along the border between cultivated and wild plants, and which promise possibilities of utilization——

Mr. HAWLEY. Did I understand you to say that you have increased the capacity of the lands in the national forests to carry 50 per cent more stock than they used to carry?

Mr. COVILLE. Yes.

Mr. HAUGEN. Fifty per cent more than it was capable of doing before?

Mr. COVILLE. Of course, some of the lands of the national forests have never been grazed, but those that are grazed are now capable of carrying 50 per cent more stock than when the forests were established.

Mr. HAWLEY. Your statement is doubtless true, but I think it should not have too universal an application.

Mr. COVILLE. The statistics on that subject, I think, can be furnished you from the Forest Service without difficulty.

Mr. HAWLEY. It is a very important statement, and I called your attention to it with the intention later on of calling the forester's attention to it, because we have many complaints that they have had to reduce the number of stock that can be grazed on the area from year to year, and something is wrong in the adjustment there in the place or the allotment——

Mr. COVILLE. I can discuss that question if you wish—if you have time for it.

Mr. HAWLEY. I will not push it any further. I just called your attention to the fact, thinking you might not want to make it too universal in its application.

Mr. COVILLE. I maintain that grazing on the public forests has increased 50 per cent since the forests were established and since we have been finding out how to handle the stock in order to make the best plants yield the most.

The CHAIRMAN. That is a very important line of work you are developing.

Mr. COVILLE. The experiments have been conducted in accordance with a definite cooperative plan, as originally laid out, and the work has been carried on largely by the Forest Service. About $30,000 a year is now devoted to it. We are acting largely in an advisory capacity with reference to it.

Mr. HAWLEY. Have they resown any area with seed of the original plant or transplanted it from one portion of the forest to another?

Mr. COVILLE. We do that by means of the stock itself. In the original plan of this work we went first to the mountains of northeastern Oregon, on areas which had been seriously overgrazed before a national forest had been established there. The best grazing plant was mountain bunchgrass. The stock stayed on that and kept it continually eaten down until there was not a 10 per cent stand of the roots on many of the areas. We let this grass grow and kept the stock off it during the time it was forming its seed stalks and maturing its seeds. After that we allowed the stock to go on it, about the

first week in September. They grazed all the grass and they trampled the seed into the ground. Thus we not only harvested the crop out, without the enormous cost of artificial reseeding, seeded the ground and harrowed the seed in.

Mr. HAWLEY. Do you know whether they have gathered any of the grasses and resown them in different areas?

Mr. COVILLE. To a small extent. For instance, bluegrass does well in certain forests in Utah, but these are minor experiments. It is primarily a question of management. If proper management were applied to the public land—and about 300,000,000 acres still remain outside the National Forests—we would undoubtedly increase immensely the yield of beef, wool, and mutton. We unquestionably could increase the yield on these public lands 50 per cent, and I believe it could be increased 100 per cent on a large part of the overgrazed areas.

Mr. HAWLEY. Have you endeavored to establish cooperative relations with the Department of the Interior?

Mr. COVILLE. In this matter of grazing?

Mr. HAWLEY. Yes.

Mr. COVILLE. I think that department has conducted no investigations of these things. The Department of Agriculture is now investigating the grazing lands outside of the National Forests on a grazing reservation of about 200,000 acres in New Mexico. That work is also carried on, under this same plan, by the Forest Service with the cooperation and advice of the Bureau of Plant Industry.

The CHAIRMAN. Is there any duplication of your work with that of the other bureau?

Mr. COVILLE. No; it is a joint project. The plan was originally laid out by the Bureau of Plant Industry at the request of the Forest Service, and it was believed that most of the money should be under the Forest Service appropriation.

The CHAIRMAN. You said your work was largely advisory to the Forest Service?

Mr. COVILLE. Yes.

The CHAIRMAN. You mean by that that you get the information and turn it over to them; or what do you mean?

Mr. COVILLE. After a cooperative project has been drawn up and determined upon by the department, some one has to supervise it. The supervision in this case is by the Forest Service, and not by the Bureau of Plant Industry. I myself make trips of inspection to places where investigations are going on and make suggestions to the men in the field. Formal advice is given here in Washington when the cooperative projects are gone over each year for modification or revision.

Our experiments in the cultivation of various wild plants have turned up most interesting results. Take, for instance, the cultivation of the blueberry, which is also called the huckleberry in some parts of the United States, though the true huckleberry is a different and less desirable plant. We found out that the blueberry would not grow in a fertile soil; that it required an acid soil, and that it thrived especially well in a soil made up of peat and sand. In such soils we have had remarkable success in the cultivation of this berry. I have a few photographs here which will serve as illustrations. This photograph [indicating] shows three large plants growing in an acid

soil and a very small plant of the same origin growing in fertile soil in a glass pot. Note the conspicuous difference in the size of the plants.

We have increased these blueberries in size until we have grown them in greenhouses up to a diameter of seven-eighths of an inch as shown in this photograph [indicating].

The CHAIRMAN. That is a very peculiar plant that grows so finely without food. What is your explanation of that?

Mr. COVILLE. It requires food, of course, but it does not take its food in the ordinary way. The curious feature of this plant is that has on its roots a beneficial fungus. That fungus must have an acid soil in which to grow. The plant has become dependent upon this fungus as a medium through which it gets its food, and the fungus will not grow in a neutral or alkaline soil. The soil must have an acid reaction. We do not attempt to grow ordinary plants on acid land until the ground has been limed and worked over and brought into a condition where the nitrogen is in the form of what we call nitrates, but this plant—and I may say a good many other plants also—can grow in these acid soils where these beneficial root fungi develop.

We have also been raising hybrids between two kinds of wild blueberries. Here [indicating photograph] is an ordinary quart basketful of cultivated blueberries. I could go into much greater detail in regard to this. The subject is one of remarkable interest. We have turned up a whole group of things that will grow in these soils—not staple agricultural plants, for the most part, but chiefly plants of minor horticultural importance. The principal reason why rohododendrons die in cultivation is because they are planted in good soil. They should be planted in an acid soil, and for especially good growth they should be planted in a soil made up of peat and sand.

The CHAIRMAN. We find the rhododendron growing on the mountain side in our country. Is that due to the fact that the soil is infertile?

Mr. COVILLE. In western North Carolina, and I presume, also, in South Carolina, the mountains above an elevation of 4,000 feet have a cap of peat. The whole top of Grandfather Mountain has from 6 inches to 2 feet of peat. Rhododendrons should have moisture also, and they get it there; they have superficial roots. Blueberries grow wild especially well along the coast from New England to Florida in acid sandy soils and within range of the cool, moist ocean winds.

Mr. HAWLEY. I was up in Maine in the blueberry season, and they have a good many there. Is it possible to improve the wild growth so as to increase the size?

Mr. COVILLE. Undoubtedly. The canneries are dependent upon the wild blueberry, for which they have a system of management. The management consists in burning the bushes about every three years. This is a cheap method of pruning. The burning should be done very carefully, however, in spring, so as not to consume the peat in which they grow. Otherwise, especially when burned in the summer or any dry period, they would suffer severely.

Mr. HAWLEY. About these wild grasses, when the settlers first went to Oregon there grew a very luxuriant wild grass that the

elk and deer fed on all winter long. It is almost entirely gone now. Apparently it will not stand the tread of heavy animals. Would it be possible to work that grass so it could be restored, to develop a strain that would stand more pasturing?

Mr. COVILLE. The only bit of original Willamette Valley grass land that I ever saw was a patch that had been preserved by Judge Waldo at Macleay. Practically all the wild land has been taken up. I do not believe the wild grasses would produce as much as cultivated crops.

Mr. HAWLEY. But there were a good many acres there that were not cultivated.

Mr. COVILLE. I am not familiar with that particular area. In northeastern Oregon, in the bunchgrass country, the big bunchgrass thrives on "scab lands," which are too rocky to plow. It will furnish a maximum amount of feed by managing it properly—not grazing it all summer, but grazing it at periods so as to give the plant time enough to renew the strength of the roots between grazings, and letting it reseed when necessary. I believe it is far better than any cultivated grass you could introduce into such lands. It is a question of management. Until you know the life history of the best grazing plants you can not manage grazing lands intelligently, and, as soon as you do know the life history, you know exactly when to put stock on the land, when to take it off, and how much to put on.

STATEMENT OF MR. E. C. CHILCOTT, AGRICULTURIST IN CHARGE OF DRY-LAND AGRICULTURE INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, take up item No. 92, please.

Dr. TAYLOR. Item No. 92 is the one we know as the dry-land agricultural work, all of which is conducted west of the ninety-eighty meridian, and which applies to dry-farming conditions. We ask no change in this appropriation.

The CHAIRMAN. Your proviso there has the limitation: "*Provided*, That the limitation in this act as to the cost of farm buildings shall not apply to this paragraph."

Dr. TAYLOR. That proviso has been in this item for several years, it having been found impracticable to erect suitable buildings on the field stations established under this paragraph within the $1,500 limitation for farm buildings, which is the general limitation upon the bureau. As will be noticed in item No. 72, our general paragraph, we have authority to erect buildings, "provided, that the cost of any building erected shall not exceed $1,500."

The CHAIRMAN. I notice, in looking over your program, that there are a number of these stations—Williston, N. Dak.; Mandan, Lawton, and so on. How much do these stations usually cost to establish?

Dr. TAYLOR. For the initial establishment, roughly, from eight to ten thousand dollars. In the case of Mandan, where the work was inaugurated on a larger scale and covered a wider type of work, it cost considerably more than that, but, on the average, it costs from $8,000 to $10,000 to establish these stations.

The CHAIRMAN. And what are these stations?

r. TAYLOR. They are essentially field stations, the work being ely field experimentation. They are, in effect, dry-farming exnent stations.
ıe CHAIRMAN. They are to that country what the Arlington ı is to this section?
:. TAYLOR. Yes, sir.
ıe CHAIRMAN. Field stations?
:. TAYLOR. Yes, sir. At these stations not only are these agroic experiments carried out, but it is work where cooperative relaı are advisable, as they constitute working facilities for many s of the bureau.
ıe CHAIRMAN. How many of these stations have you?
:. TAYLOR. Twenty-three altogether. That includes these staı which are maintained and operated by certain of the States, at h we cooperate in this line of work. Eight are maintained by lepartment as separate independent field stations.
ıe CHAIRMAN. I think that is rather an important line of in-r. Are there any questions on that, gentlemen?
:. HAUGEN. I would like to have the doctor go into the details the work that is being done by Prof. Chilcott. I would also like ıow whether it included the sinking of wells, as was done some ı ago by your bureau.
:. TAYLOR. I do not know whether it was done. It was thought t. I will ask Prof. Chilcott to go into that phase of the work.
.e CHAIRMAN. Very well; we will hear from Dr. Chilcott.
:. CHILCOTT. In view of the outline that has been given by Dr. or, and in view of the fact that I have appeared before this nittee for a number of years and have gone over my work, so. I think the older members of the committee are quite familiar the general outline of the work, I will not waste very much in a general summary of it. I would call the attention of the nittee to one phase of the work that has changed somewhat; is, it has developed since our last meeting with the committee. is as to the work at the Mandan station in North Dakota. As ılready been mentioned, this station is conducted on a larger than any of the other stations. We had a somewhat different ose in view when we established it. It was to deal primarily trees, plants, and shrubs, and incidentally with the general agrire problems of the area. This station was established in 1912. ıegan developing and building in 1913 and started to put out at that time. It was not until this present spring that we were ıosition to send out from the station any trees for he purpose of ırative work with the farmers of that region. I would like to he attention of the committee to the real problems we have out . On these two sheets I have here [exhibiting] you will find nber of photographs taken of farmsteads in the vicinity of lan, N. Dak. These photographs are the result of a telegram t to the superintendent of the station in December asking him t a few photographs showing farmsteads in the vicinity of lan. He made one trip north and another trip south and he had taken photographs of all the farmsteads he passed t two. That will give you an idea of the barrenness of the

country and the almost total absence of any trees or any protection whatever. The fact that they have not been able to raise trees there shows that something ought to be done. On this card I have gathered a few photographs taken from various points where the climatic conditions are as severe as those prevailing in any other part of the area and where trees are now growing.

Mr. HAWLEY. Are any of these near Mandan?

Mr. CHILCOTT. One is at Dickinson, right west of Mandan, where climatic conditions are fully as severe as there. Some of them are over in Canada.

Mr. ANDERSON. This has all been done without any assistance from the Federal Government?

Mr. CHILCOTT. No; that work has been done in cooperation with the State governments, and the tree planting in Canada has been done in cooperation with the Canadian Government. It shows that trees can be grown there if proper methods are used, but the farmers do not and can not raise trees until they have some assistance.

The CHAIRMAN. What is the rainfall at Mandan?

Mr. CHILCOTT. Around 17 inches; at Mandan running as high as 20 inches in some parts and down to 12 inches on other parts of the area where this work is being carried on.

The CHAIRMAN. Here [referring to photograph] is a farm that does not seem to have any trees growing around it at all, and here [indicating another photograph] is one at the top that shows some trees.

Mr. CHILCOTT. I hardly think those are trees. I think they are cornstalks.

The CHAIRMAN. Cornstalks do not grow that high up there, do they?

Mr. CHILCOTT. Evidently you have not been up there. That is simply to show the conditions that prevail out there. These show the farmsteads of men with capital and enterprise who have been endeavoring to build homes there but have failed to have anything in the way of comforts such as come with the growing of trees. The photographs showing the growing trees indicate what might be done here as it has been done among the farmers in other places where the climate is quite as severe.

Mr. HAWLEY. How did they solve the problem; with your assistance?

Mr. CHILCOTT. No. We have been at this only three years. That work at Williston and Dickinson, N. Dak., was done by the State but nothing was done to spread that work out beyond the station. It is only in Canada that the Federal Government has taken the matter up systematically, and they have done an enormous amount of work there and have been successful. We are cooperating at these other stations. We know what the conditions are at these stations. At Williston and Dickinson, particularly the conditions are more severe than they are at Mandan.

Mr. LEE. What crops are produced on this land?

Mr. CHILCOTT. It is primarily a wheat country, but they also grow corn, oats, and barley.

Mr. ANDERSON. Have you outlined the plan of operation at the station at Mandan that does this work?

Mr. CHILCOTT. Do you mean, have I outlined it to the committee here?

Mr. ANDERSON. Yes.

Mr. CHILCOTT. No; I have not outlined it to the committee.

Mr. ANDERSON. I would like to have a statement made outlining the activities of the station and why the work is carried on—this shelter-belt cooperation.

Mr. CHILCOTT. You are primarily interested in the shelter belt? The shelter-belt work represents roughly 25 per cent of the activities of the station. The major portion of the work of the station is devoted to other things—general agricultural and agronomic problems. We are carrying on some grazing work there in cooperation with the North Dakota experiment station. We are experimenting along the same lines as at the other stations—crop rotations, moisture, conservation, cultivation, and other things that have to do with growing of staple crops. In addition to that, we are doing a great deal of experimental work with horticultural crops and garden crops of various kinds. We are trying to show those farmers how they can raise gardens, what are the best kinds of vegetables to raise, and how best to raise them.

We are also doing a good deal of experimental work along the line of developing trees for this shelter-belt work. We get a large number of foreign trees through the office of Foreign Seed and Plant Introduction of this department, and plant them there and test them out. So the work is devoted largely to other things than the shelter-belt work, which is confined to producing rooted cuttings and seedling trees for cooperative work with the farmer in the northern Great Plains. It would be manifestly impossible for us to determine the best methods of handling these trees or the best varieties of trees for the region, if we were to confine ourselves strictly to the single locality of Mandan, where the soil is quite different from that in other places. There is a very wide range of soil in the four States of North Dakota, South Dakota, Montana, and Wyoming. In order to learn what is the best method of handling the trees and what are the best varieties, we must try them out at a great many points, and therefore we cooperate with the farmers in that region.

Mr. HAWLEY. What trees do you try to grow there?

Mr. CHILCOTT. The cottonwood, certain kinds of elms that are grown there in some places, but primarily the cottonwood, box elder, willows, green ash, and caragana.

Mr. HAUGEN. Does the pine grow there?

Mr. CHILCOTT. We are trying the pine at the station, but are not sending those out.

Mr. HAWLEY. Are you trying to introduce any fruit trees?

Mr. CHILCOTT. We are not doing that cooperatively with the farmers, but are experimenting with them on the station. We are not sending out fruit trees. We know it will be impossible to raise fruit trees until they have something to protect them from the sweep of the wind across those prairies. We are trying to help them get into position to get that shelter belt, knowing that when they get that there will be no question but what they will develop other lines of tree-growing there, including the fruits. When you once get them started, they will be able to get what they need from the nurserymen principally. They will not and can not raise such trees there now. They have been trying for 30 years and have failed in a

majority of cases, and they will continue to fail unless they have some help. We do not know positively that we will be able to succeed in helping them in all cases, but from the results that have been accomplished in Canada, we feel encouraged to believe we will. We think we can get the shelter belt started, and that means a beginning of real importance on their part; but until they get the shelter belt there, so they can grow some fruit and have things of that kind, there will be no real home building there.

Mr. ANDERSON. When you say you cooperate with the farmers in the shelter-belt work, do you mean you furnish them trees?

Mr. CHILCOTT. We furnish trees and planting plans and inspect the work. That is the part of the work we do. They are under our supervision and care for as long as we think advisable to look after them, which we believe will be three or four years. It is understood in our agreement that we shall have access to these farms as long as we need it.

Mr. ANDERSON. To what extent have you furnished trees up to this time?

Mr. CHILCOTT. We are prepared to send out trees to about seven hundred and some odd people, I believe.

The CHAIRMAN. Seven hundred and thirty-four, as I recall it.

Mr. CHILCOTT. Yes; I think the chairman has those figures.

Mr. HAUGEN. From this station, Mandan?

Mr. CHILCOTT. Yes.

The CHAIRMAN. This statement says 732 applicants, and that you have actually sent out trees to 461.

Mr. CHILCOTT. Yes.

Mr. ANDERSON. Just put it into the record. I do not care to take up time now with it. How many trees are ordinarily sent under this plan to the individual farmer?

Mr. CHILCOTT. About nine hundred.

Mr. ANDERSON. What about the market value of those trees?

Mr. CHILCOTT. I do not know; but they estimate in Canada that they cost less than $1 per thousand.

Mr. ANDERSON. To produce them?

Mr. CHILCOTT. Yes.

Mr. HAWLEY. The farmer pays the cost of transportation?

Mr. CHILCOTT. Yes.

Mr. ANDERSON. How long do you think it will be necessary or desirable to carry on this cooperative shelter-belt work? Is that to be a permanent scheme?

Mr. CHILCOTT. I have an idea that it will have to be carried on a good many years, because the number of people we could serve with our facilities would be so small that it would take many years before we could get over the entire area or get enough trees in there to serve as an example of what ought to be done.

Mr. ANDERSON. Do you think that, as long as the department continues the plan of supplying these trees free of charge, it will be an inducement for anybody to plant them unless they do get them free of charge?

Mr. CHILCOTT. I certainly think it will. The superintendent of the [illegible]'t in Canada made a statement to our superintendent, who was [illegible]e last year, that he believed the work they had done had increased the demand for nursery stock tenfold in the territory in

which he was operating. I have every reason to believe it increases the demand for nursery stock, because we confine our work to a few varieties of trees. They will want ornamental trees and fruit trees to try out, and therefore, having the shelter belt that will protect those, they will naturally get them from the nurseryman.

Mr. REILLY. Where do you get the trees?

Mr. CHILCOTT. Raise them right there.

Mr. REILLY. Why do not the farmers go and get those trees themselves?

Mr. CHILCOTT. They do not seem to be able to do it successfully.

Mr. REILLY. Haven't they the money?

Mr. CHILCOTT. Yes; but they have not the technical skill and experience in growing trees in that region.

Mr. REILLY. Can you not give them the scientific information you have and can not they apply it?

Mr. CHILCOTT. They do not seem to have been able to apply it. Bulletins and information in printed form have been sent out there for years, and this is the result.

Mr. REILLY. Are you not getting the farmers there in a condition of mind to wait for you fellows to come along and do the work for them?

Mr. CHILCOTT. No; I do not think there is any danger of that. Growing trees is a subject that they do not appear to know anything about. They have put in trees under such conditions that they could not possibly live, and they have done it until they have become discouraged about the growing of trees.

Mr. REILLY. If you put one grove in a neighborhood, would not that be an incentive to the rest of them to get their own groves?

Mr. CHILCOTT. At the rate we have been sending them out we have been able to put in an average of one planting to every six townships.

Mr. REILLY. Your idea is that that is going to be an example for the others to imitate?

Mr. CHILCOTT. That is the idea; but it will take a good many examples if we get one planting in each township. We would have to keep on with our present cooperative work for at least six years at the rate we are now going, and it is not likely that we could get them evenly distributed. We furnish trees to only those who ask for them. We have made no effort to persuade anyone to plant trees. We have put notices in the newspapers and have taken the applications as they came, and we have rejected some where the men had not prepared the land in a proper way.

Mr. HAWLEY. You have an agreement with each farmer that he will follow out your instructions?

Mr. CHILCOTT. Yes.

Mr. HAWLEY. Do they do it?

Mr. CHILCOTT. I do not know what they will do. They have followed out the instructions so far as the preparation of the land is concerned, but they have not yet received the trees.

Mr. HAWLEY. How many of those 460 lots that you have sent out up to date are doing well now?

Mr. CHILCOTT. We have not sent them out. We are talking about these that are ready for distribution. We require applications put in two years ahead, so we can have the land properly prepared. The

[illegible]

[illegible]

[illegible]

If we know the land is in proper condition to plant—if the man has gone on and got the ground in one season in excellent condition for planting, we believe we are reasonably safe in believing he will put those trees in properly. Of course he may not, but if he does not we simply break off cooperative relations with him and he gets no more trees.

Mr. ANDERSON. Will the activities of the department in this direction be practicaly limited to the extent they are now, or is it intended to extend them?

Mr. CHILCOTT. That is a matter of bureau policy, upon which I am not prepared to speak. My own idea is that we have now nearly reached the limit of our productive capacity there and that we will not greatly increase the output from that station. I believe, if we continue to put out from 700 to 1,000 plantings each year, that we will be able to serve the people. In Canada they advertise with large posters along the roads and solicit trade, and they have as high as 5,000 applications a year that they fill.

Mr. HAUGEN. With what success have those trees been grown and how long have they been growing?

Mr. CHILCOTT. Most excellent success. I think they have been out there about 12 years. Here are one or two photographs that we have here [exhibiting].

Mr. HAUGEN (referring to photographs). Where was that experiment carried on?

Mr. CHILCOTT. Indian Head, Saskatchewan. It is about 300 miles northwest from Mandan.

Mr. HAUGEN. Very little has been done in eastern Canada?

Mr. CHILCOTT. I think this particular work has been confined to Saskatchewan and Alberta.

Mr. HAUGEN. How much of it in Saskatchewan?

Mr. CHILCOTT. They have done a great deal of work in Saskatchewan; I do not know how much. I have not visited any stations up there; but some of our men have visited them and have made written reports to me.

The CHAIRMAN. Suppose you briefly outline what you do at these 23 field stations that you have, so that it may be a matter of record here.

Mr. HAUGEN. I suggest that the Doctor take up one station and give in detail the work done at that particular station.

The CHAIRMAN. Suppose you take up the field station at Akron, Colo.

Mr. HAUGEN. Would it not be well for him to take up an independent station?

Mr. CHILCOTT. The Akron station is one of the eight stations operated independently of the State experiment stations. There, as Dr. Taylor mentioned, we not only carry on the work bearing upon soil cultivation, crop rotation, and the conservation of moisture, which is primarily the work of this office, but we make an effort to provide facilities at that station for all other offices of the Bureau of Plant Industry who desire to carry on field work in that locality. You all heard something of the work that is being done in the alkali and drought-resistant plant investigations when Mr. Kearney was here yesterday. Dr. Briggs was also here yesterday and described his

work. They are both of them cooperating at these stations. We have provided facilities for the investigation of forage crops at all of these stations. I am sorry to say, though, that in too few instances has the Office of Forage-Crop Investigations availed itself of our facilities. However, I have an idea it was because they did not have money enough. At any rate, we try to encourage the use of our stations by the offices of the bureau dealing with experimental work of various sorts. Our main problem is the developing of dry-land agriculture in that area. The Office of Cereal Investigations cooperates with us. We provide facilities for them at all our stations, and they take advantage of them. As the chairman has mentioned, we are trying to do in a way for our areas much of what the Arlington Farm is trying to do for this locality here—having a station where the general problems vital to the agriculture of that vicinity can be carried out and with but little expense to the office cooperating there. The overhead charge falls on us.

Mr. LEE. The overhead charge in Washington is $25,000 or more. That seems heavy.

Mr. CHILCOTT. Not when you figure that on a percentage basis and compare it with other offices. This appropriation involves an expenditure of $160,000, which is one of the largest items that we have in our bureau, and I do not believe this overhead expense is any higher in proportion to the total than for other offices. I am sure it is necessary. That includes salaries, traveling expenses, and office expenses of two field assistants who have headquarters in Denver but spend practically all of their time during the summer traveling from station to station and supervising this work. During the winter they are down here, but their salaries and expenses are paid out of that fund.

With so many stations operating at so many points, we have to have enough in this administrative fund so we can supplement the station allotments, if necessary. The climatic conditions that prevail during the season vary widely. Maybe one year we have an enormous crop on account of having plenty of rain, and it costs twice as much to do the work that year as it does in a dry year.

The CHAIRMAN. I noticed you made the statement somewhere that when these men at these stations have finished their season's work and made their experiments, they are frequently called to Washington to assemble their notes and draw their conclusions. Doesn't that expense come out of this $25,000?

Mr. CHILCOTT. Not ordinarily.

The CHAIRMAN. I was wondering what special advantage you could have in bringing these men to Washington to assemble their data and study out and reach their conclusions.

Mr. CHILCOTT. The principal reason for that is that these men are all working on the same kind of crop problems in dry-land agriculture; the work is replicated at these different stations, and they must come together and compare notes. They want to know what results those other 22 fellows that are working along the same problems under other climatic conditions are getting. It is that comparison that enables us to draw conclusions from a very large number of experiments at a great many different places. We have issued seven bulletins dealing with this work. I have them here, and they are de-

riptive of the different kinds of work and show the number of men volved. Of course, they are available for any member of the committee or anyone else.

The CHAIRMAN. These men could get together at any other point han Washington to compare their work, could they not?

Mr. CHILCOTT. Yes; but where would I be? That is the real oint. I feel that I have to be here in Washington during the winer, and I keep in the closest personal touch with all this work. They an carry the work to a certain point without my personal supervision, but, when it gets to a certain point, as in the case where data re submitted for publication, before those bulletins go into print, I want to confer with these men and get their personal viewpoint.

The CHAIRMAN. I do not want you to think that my question implied any criticism of that course.

Mr. ANDERSON. These are not issued as regular farmers' bulletins, are they?

Mr. CHILCOTT. No.

Mr. ANDERSON. Are they issued as bulletins of the Bureau of Plant Industry?

Mr. CHILCOTT. In the department series.

I have described this one station at Akron, which would cover the independent stations. The other——

Mr. HAUGEN. Before you go into that, give us the result of your work.

Mr. CHILCOTT. You could get that from these seven bulletins. I could go into an analysis of them, but it will take time.

Mr. HAUGEN. What is the most important achievement of your bureau in that division?

Mr. CHILCOTT. The most important achievement, I think, is demonstrating beyond a reasonable doubt that the salvation of that dry-land country lies in the growing of live stock. I think we have demonstrated that grain farming, without live stock, is not likely to be successful anywhere in that region. I believe that that is very important, because when we began the work there was a very large portion of the country devoted almost exclusively to grain raising, and they were advising expensive methods of tillage, alternate croppings, and many methods of that kind that involve a great deal of labor; that was exploited quite widely. We are convinced now that, if a man will devote about half of his farm to raising of forage crops, particularly, like corn and other crops of that sort, and feed them to his live stock, and then raise his wheat on a suitable acreage, he would make more money than if he attempts these intensive methods.

Mr. HAUGEN. Then you have found that grain growing in that section is not profitable?

Mr. CHILCOTT. I would not want to put it that way, because you can raise grain there profitably if it is done in connection with livestock farming. You can raise a crop of wheat after a crop of corn more profitably than after a summer fallow.

Mr. HAUGEN. Provided you have sufficient moisture.

Mr. CHILCOTT. You are likely to have sufficient moisture to do it in a sufficient number of instances to make it profitable.

Mr. HAUGEN. In the last few years they have had a heavy rainfall.

Mr. CHILCOTT. The ten years that we have been experimenting there have included some extremely dry years. It has been 35 years since I first went out there.

Mr. HAUGEN. What do you suggest to the farmer going into that section of the country?

Mr. CHILCOTT. I suggest that he keep out of the country unless he has enough capital to buy some cows in addition to his work stock, so that he can make live stock the principal industry there. Unless he can do that, I think he ought to keep out of there. If he has only a small capital and not enough to buy live stock of this kind, the chances are decidedly in favor of his losing what he has.

Mr. HAWLEY. You would not limit the live stock to cows, would you?

Mr. CHILCOTT. No; they should stock it with cows, sheep, horses, and hogs.

Mr. HAUGEN. Then, it is practically reduced to a stock-growing proposition?

Mr. CHILCOTT. I think so; and that brings up the problems of what kind of stock, what kind of crops, what kind of rotation. All these things are problems that will have to be worked out, but we feel that he must have live stock. The farmer must market his products as finished rather than as raw products.

Mr. HAUGEN. A number of men have gone out there with considerable money, with the expectation of raising wheat, and many of them have been sadly disappointed. What suggestions have you to make to anyone having three or four thousand dollars going into that section of the country with the view of taking up farming and doing the best he could with that amount of money on a piece of land there?

Mr. CHILCOTT. Of course, it is a big country—500,000 square miles and there are different conditions in different localities.

Mr. HAUGEN. Take the Dakotas.

Mr. CHILCOTT. I would say that the first thing is to get hold of a bunch of stock of some kind, and then adapt his farming to the growth of that stock. There are places there where he can range his stock on Government land, and he can range his stock on nonresident land in many instances. But when he goes to grain farming, let that be a secondary part of his activity. He should farm to produce feed for his stock instead of raising grain primarily as a cash crop.

Mr. HAUGEN. Where the department undertakes to instruct people what to do, would it not be well to point out to those people the most profitable crop? With the experience you have had, what crop would you suggest the most profitable to grow?

Mr. CHILCOTT. Live stock. I realize that they want a ready-money crop there of some kind. They can raise some grain there for sale, but that is secondary, and they should have stock enough to consume that grain if the prices are low or the quality of the grain is inferior, as it frequently is. They ought not to have to sell that grain at a low price on the market, but should convert it into meat, wool, dairy products, or horsepower.

The CHAIRMAN. One of your problems is the problem of transportation?

Mr. CHILCOTT. Largely.

The CHAIRMAN. In other words, you can raise alfalfa in a great many of these sections very cheaply, but by the time you get it to the railroads the expense has eaten up the profits?

Mr. CHILCOTT. That is true.

The CHAIRMAN. And, therefore, you have to work on a plan to concentrate the roughage into something that it does not take so much to transport.

Mr. CHILCOTT. That is the idea.

Mr. HAUGEN. A number of people from our section have gone out into this country. They have been reading the bulletins about intensive farming—this dry-land farming—and after reading the bulletins they have gone out there with the expectation of growing grain. They have gone there and have lost their money, and many of them have not enough money to get back home. I believe the Government has been instrumental in encouraging those people to go there, and I was trying to ascertain the position of the department as to advising people——

The CHAIRMAN. As I understand it, the Department of Agriculture does not advise people where to locate.

Mr. CHILCOTT. No; not where to locate.

The CHAIRMAN. I take it that the great movement of people to that dry-land country out there was due largely to our reclamation policy, which was established before I came to Congress, and now, perhaps, the department is trying to take care of those people as best they can. But you do not advise them to emigrate to North Dakota or South Dakota?

Mr. CHILCOTT. No, sir. We do not advise them where to locate. We give them the facts and they must decide for themselves.

Mr. HAUGEN. But it has been stated that inquiries come from all parts as to how a man should proceed, and that the department is asked for advice and gives it.

Mr. CHILCOTT. We give advice as to what people should do out here when they are there and when they want to know the facts. If a prospective settler writes and wants to know the facts prevailing in different parts of the country, we try to give him the facts. I want to say that if any of you will look up the bulletins issued from my office over my signature or any Yearbook articles that have appeared, you will see that I have always maintained a very conservative attitude. I have talked practically the same thing I have given you here, and it has met with a good deal of opposition on the part of those interested in the exploiting of land out in that country. It is only within the last two or three years that the railroad companies, particularly, have come around and admitted that we are right. We now have the indorsement of practically all of the railroads operating out there in that dry country. I have here an address that I delivered at Denver before the Dry Farming Congress. It is published in the Southwest Trail, a paper issued by the Rock Island Road, and it indorses my statement entirely along that line.

The CHAIRMAN. I will ask Dr. Taylor whether this is the policy of the department in reference to work out there. I am reading

from the annual report of the Chief of the Bureau of Plant Industry for 1911. Speaking of irrigation agricultural investigations you say:

[illegible] has not been done in a single State to settle the problem of profitable irrigated cotton growing, with records of [illegible] which have been available. Cotton culture in the irrigated districts of the West has been [illegible] the need of [illegible] agricultural efforts [illegible] and [illegible] Some of the most distinct successes [illegible] in the use of water [illegible] Recently [illegible] the Salt River Valley, Ariz., as here seen to arise [illegible] these successful [illegible] irrigation efforts in this region. It [illegible] the methods [illegible] have been accomplished for, in a [illegible] the work [illegible] Less pioneer farmers, but [illegible] has established [illegible] These obstacles [illegible] the elimination of many [illegible] methods and systems of farming that have been taken advantage of [illegible] and [illegible] have either [illegible] to [illegible] but through some newly discovered method [illegible] Experience has shown that none of these systems [illegible] in overcoming the effects of severe and long-continued droughts [illegible] The entire region is capable of supporting a permanent and profitable [illegible] but this will be accomplished or retaining the cost of [illegible] upon [illegible] and the new system of farming methods; or making it possible [illegible] than grain raising the [illegible] farm [illegible] and by carrying over the surplus crops of favorable years to supplement the scanty crops of unfavorable seasons rather than by depending upon [illegible] of irrigation to overcome the effects of severe droughts.

That statement of the department seems to be as vigorous and strong as it was to make in the English language.

Do you regard it as an effort to express the situation as we see it—not to discourage but to encourage steady effort with reference to the development and maintenance of dry farming. We do not believe it is impossible to make a success of dry farming, but we do believe that care and foresight and conservation are necessary. I think, as Prof. [illegible] has stated, that the more than the department has done [illegible] for a number of years, has furnished a body of facts, in addition [illegible] which constitute at the present time perhaps the most important working element in the whole situation.

The Chairman. The attitude of the department, to use a slang phrase, is that if you go into this region out there, be sure to go with your eyes open and know what you are going to do?

Dr. Taylor. Yes, sir.

FURTHER STATEMENT OF DR. WILLIAM A. TAYLOR, CHIEF OF THE BUREAU OF PLANT INDUSTRY.

Mr. Anderson. Mr. Chairman, I would like to get into the record a statement of the different kinds of bulletins issued by the department.

The Chairman. You mean the different types of bulletins?

Mr. Anderson. Yes; the different types of bulletins. I find among my constituents there is a good deal of confusion as to the kinds or types of bulletins issued by the department. I am frank to say I do not know myself, and I would like somebody to make some sort of authoritative statement somewhere in this hearing as to the different types issued.

The Chairman. Dr. Taylor, can you put that in the record?

Dr. TAYLOR. I can say briefly for the information of the committee at this time that the general publications of the department at present consist of the following:

The Journal of Agricultural Research, which is issued periodically in small editions and carries the technical results of the more important original research work done by the department and the State experiment stations. That is not circulated among the farmers.

Mr. ANDERSON. Just state the character of the circulation of these bulletins, please.

Dr. TAYLOR. The circulation of the journal is almost exclusively to research institutions and libraries. It is a technical journal of agricultural research, but it is open to subscription by individuals through the superintendent of documents; however, it is not distributed to individuals.

Second, we have the series of department bulletins, of which these [indicating] are examples. The bulletins in this series are of two types. One type is the professional paper, which contains rather technical matter, usually more technical than would be of interest to the farmer except in cases where he carries on a highly specialized phase of farming such, for example, as blueberry culture, which Mr. Coville has just discussed. The last bulletin on that subject (Bulletin 334) is such a professional paper—not of interest to the general farmer, and not provided in editions large enough to mail to him, but of great interest and value to expert horticulturists engaged in work of this highly specialized type. These professional paper bulletins are available upon special request to the extent that the editions permit. The other type of department bulletin is essentially popular in character. It is issued usually in larger editions than the professional paper and is intended to convey to the reader the results of the more general and less technical investigational work of the department upon a particular subject.

We now reach the Farmers' Bulletin series, which is primarily aimed at the farmer and which is intended to tell what to do, and how, where, and when to do it. In other words, it is a concise, clear, rather dogmatic instruction of the farmer regarding a subject of immediate practical importance to him.

Those are the general types of publication now. In addition to those, there are issued also from time to time unnumbered leaflets, ephemeral in character, and usually bearing directly upon some emergency feature not regarded as of sufficiently continuous importance to justify preservation in the numbered series.

Mr. ANDERSON. I have heard the claim made that a great many investigations are carried on by the department the results of which never find their way into any sort of department bulletins. Is that true? If so, to what extent?

Dr. TAYLOR. In recent years, increasingly during the past two or three years the results of a good deal of technical work have been published in the scientific and technical journals, it being regarded as more certain in that way to reach the audience which is most interested in the particular type of work—for instance, the chemical work in the chemical journals and certain agronomic work in the Journal of Agronomy—which is not regarded as in a form suitable for the farmer. That practice, it should be said, considerably re-

duces the drain upon the printing fund, which it is necessary steadily safeguard in order to print what must be printed and tributed by the department.

The CHAIRMAN. Where is your printing fund for this type work?

Dr. TAYLOR. In the printing bill.

The CHAIRMAN. Not in this bill at all?

Dr. TAYLOR. No, sir.

The CHAIRMAN. You have an item of $500,000, I think, for y Farmers' Bulletins, and so on, but that is carried in the sundry c bill?

Dr. TAYLOR. Yes. Of course, there should be mentioned also Yearbook of the department, which is familiar to you all.

STATEMENT OF MR. F. D. FARRELL, AGRICULTURIST, WESTE IRRIGATION AGRICULTURE INVESTIGATIONS, BUREAU PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, please take up the next item, No. " for investigations in connection with western irrigation agri ture, the utilization of lands reclaimed under the reclamation and other areas in the arid and semiarid regions." There seems be an increase of $5,000 asked for there.

Dr. TAYLOR. This item is the one under which has been prosecu for a number of years our investigations as to crop production the Government reclamation projects. The investigations are ried on through field stations located upon these projects, the w being established and undertaken at the request of the Departm of the Interior when it became evident that the development agriculture upon the projects was going to require a good more than the turning loose of inexperienced people to work land.

The increase of $5,000, estimated for here, is to make possible undertaking of irrigation studies at Lawton, Okla., where we h a dry-farming field station, under conditions that appear to rer intensive irrigation important as a supplemental feature of farm, which must always be a nonirrigation farm. There is water enough in that section for irrigation agriculture. But the apparently a possibility of developing a supplemental truck- production in a useful and important way, and this estimat for that. Mr. Scofield, who has charge of this work, is not here, Mr. Farrell, who has long been associated with it, and who now charge of our demonstration work on reclamation projects, can cuss the details of it.

The CHAIRMAN. All right, we will hear Mr. Farrell.

Mr. FARRELL. Mr. Chairman and gentlemen, I think it will n the situation somewhat more clear if it is explained that these w ern irrigation agriculture field stations occupy very much the s position toward irrigation agriculture as Mr. Chilcott's dry-l stations do to dry-land agriculture. The western irrigation stat are, however, limited, with one exception, to reclamation proj These stations are essentially investigational bases, where specia of the various divisions of the department, chiefly of the Burea Plant Industry, can carry on investigations in irrigation agricul

The office maintains seven field stations. Six of these are on reclamation projects and one is in the vicinity of San Antonio, Tex.

I might add to what Dr. Taylor has said with reference to the estimate for $5,000 increase that it is proposed to have, in the vicinity of Lawton, Okla., a new reclamation project. This, according to present plans, will be used almost entirely for very intensive irrigation agriculture—largely garden agriculture—for the production of vegetables and similar crops.

Mr. HAWLEY. How many acres are there in that project?

Mr. FARRELL. Between 2,500 and 3,500 acres. I think it is the intention to use it for the production of vegetables and small fruits for the use of the citizens of Lawton and the immediate vicinity. This project is now under investigation; so far as I know, it is going to be taken up.

The CHAIRMAN. Would it be settled in time to use this money?

Mr. FARRELL. The field station could be established in advance of the inauguration of the project itself, by arrangement with the city to use city water for irrigation. Because of the intensive nature of this irrigation agriculture the proposal has been made by some of the citizens of that locality that an overhead sprinkling system of irrigation should be tried out. The installation of a system of this kind will be expensive, and that is one reason the increase is as large as it is.

Mr. HAWLEY. What is your judgment about that overhead sprinkling system of irrigation?

Mr. FARRELL. I think it is thoroughly worth investigating.

Mr. HAWLEY. How much will it cost to investigate?

Mr. FARRELL. It is estimated that this system can be installed for a part of the $5,000.

Mr. LEE. Over how many acres?

Mr. FARRELL. Mr. Scofield, I think, is planning to use between 20 and 40 acres, and only a small part of that will be under the sprinkling system.

Mr. HAWLEY. You do not know what proportion of the $5,000 will be used for the construction of the sprinkling system?

Mr. FARRELL. No; that has not been settled.

Mr. HAUGEN. You do not know what the cost will be per acre?

Mr. FARRELL. No; I do not. The overhead sprinkling system is useful where the amount of water is limited and where it is desirable to get the water evenly distributed over a small acreage all at the same time.

Mr. HAWLEY. And there is not water enough there to do that?

Mr. FARRELL. No; the water supply there is very limited.

The CHAIRMAN. Suppose you take up your various stations and discuss the work briefly. I see you have a good many lines of work. Take up the station at Yuma first.

Mr. FARRELL. At the Yuma field station the chief lines of investigation relate to the methods of producing semitropical plants, some investigations of deciduous fruits and of methods of producing alfalfa seed and certain varieties of cotton. I might say that the variety of Egyptian cotton now in use in the Salt River Valley was originated at the Yuma station. The Durango cotton is also being investigated now at the Yuma farm.

Mr. HAWLEY. What value do you suppose this Durango cotton will have?

Mr. FARRELL. It is uncertain how far it will extend, but this year there is in the neighborhood of ten or twelve thousand acres of it in southern California.

The CHAIRMAN. You are sending Durango seed out throughout the South?

Mr. FARRELL. I think that is being done in certain sections by another office.

The CHAIRMAN. Take up your next station.

Mr. FARRELL. The work at the Truckee-Carson, Nev., station is devoted chiefly to the investigation of methods of reclaiming alkali soils. In addition to the work in alkali-soil reclamation, considerable work is being done by Mr. Scofield through demonstrations in cooperation with the farmers there.

At the San Antonio, Tex., field station the work is devoted to investigations of methods of producing cotton, corn, grain, sorghums, field peas, and horticultural crops chiefly. One of the most conspicuous results of the work at San Antonio was the working out of a method of producing grain sorghum down there in spite of the midge, which was very destructive of the sorghum. Other investigations at San Antonio relate to methods of crop rotation and tillage, comparable to those carried on by Mr. Chilcott farther north. One of the results of that work has been to disprove what was commonly believed to be a valuable practice down there, namely, subsoiling. It has been found, through several years of constant experimentation, that subsoiling in that section is too expensive.

At Belle Fourche, S. Dak., the work relates to crop rotation and tillage, the production of pasture crops for live stock, the testing of various varieties of cereals, and other similar experiments. In addition to that, facilities are furnished to Mr. Chilcott for experiments in dry-land investigations, and to Mr. Kearney for alkali and drought-resistant plant investigations.

I might say that some of the work at Huntley, Mont., at Belle Fourch, S. Dak., and at Scottsbluff, Nebr., is practically uniform. At these three stations are conducted the largest rotation experiments under irrigation ever carried on, so far as I know.

The CHAIRMAN. I notice at the Belle Fourche station you are trying some experiments with reference to alfalfa seed.

Mr. FARRELL. Yes, sir.

The work at Huntley is similar in many respects to that at Belle Fourche, but the farm unit on the Belle Fourche project is 80 acres and that on the Huntley project is only 40 acres.

Mr. DOOLITTLE. Let me refer to your experiment in alfalfa seed production. What was the nature of those experiments?

Mr. FARRELL. So far, they have been very simple and small. They have consisted in trying various cropping methods for seed production.

Mr. DOOLITTLE. What do you find happens when you get a rain storm?

Mr. FARRELL. That is very frequently the cause of the destruction of the alfalfa-seed crop; wind storms also.

Mr. DOOLITTLE. You mean it blows the pollen away or washes it off?

ARRELL. I suppose that is one thing that prevents seed pro-
—the destruction or removal of the pollen or the destruction
lossoms by storms.
f the most useful and conspicuous results obtained at Huntley
as to do with the working out of methods of establishing and
rass pastures for dairy cattle. The dairy industry on the
project is one of the more promising industries. There
he problems in connection with dairying has to do with the
ance of dairy cattle during the summer. The farm unit in
ion is small, and when the land is all taken up the free range
y cows will be gone. It will be necessary for the farmers
intensive and highly productive irrigated pastures.
AWLEY. Can they make a living satisfactorily on 40 acres?
HAIRMAN. The German farmer makes it on 12½ acres.
ARRELL. This matter of the size of a farm is very difficult to

ave found in our pasture work at the Huntley field station
ixture of pasture grasses and clover, treated in a certain way,
ry about eight cows on three acres. We have carried two
three-quarters of an acre. We feel certain that it will be
for most of the farmers to develop pastures that will carry
s to the acre, which will be double the carrying capacity of
nary pastures in the Middle West.
eupon, at 5.15 o'clock p. m., the committee took a recess
o'clock a. m., Thursday, January 27, 1916.)

HOUSE OF REPRESENTATIVES.
COMMITTEE ON AGRICULTURE.
Tuesday, January 25, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever chairman presiding.

STATEMENT OF MR. L. C. CORBETT, HORTICULTURIST IN CHARGE OF HORTICULTURAL AND POMOLOGICAL INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Taylor, we will take up first item 94:

For the investigation and improvement of fruits and the methods of fruit growing, harvesting, packing, storing, handling, and shipping, and for experimental shipments of fruit within the United States and to foreign countries, $105,060.

There seems to be no change in the amount of that item.

Dr. TAYLOR. There is no change in either the amount or the language of the item. This is the item under which for a number of years there has been prosecuted this constructive work of the bureau with regard to the determination of the adaptability of the varieties of fruit to different sections, the improvement in methods of propagation and culture, and also studies of the behavior of fruit while undergoing handling, harvesting, storing, and transportation. This is a work which has been productive of very important results in commercial fruit growing, and has in a number of respects resulted in the profound modification of methods in commercial fruit growing and handling. Prof. Corbett has charge of this work and will discuss it, if it is agreeable to the committee.

Mr. CORBETT. Mr. Chairman and gentlemen, this work, as Dr. Taylor has explained, has to do with the handling of perishable products particularly fruits and vegetables. The first item under the head of pomological investigations has to do with fruit handling and storage investigations. In explanation of the work on this project, I have placed on the wall a chart that gives the results of some of the handling work. To explain the problem somewhat, I will say that for many years the citrus fruit industry of the United States, in particular, has suffered very great loss in transporting its fruit from the point of production to the point of distribution at the market. This green line on the chart indicates what the ordinary commercial methods followed in Florida and California as well, have resulted in in the way of loss of fruit—practically 20 per cent. After the grower thought he had produced it well, taken good care of it and put it in boxes and sent it on board the cars, when it reached the market he found it in the condition indicated. The problem was to find out the difficulty which brought about this deterioration

and, beginning at the condition that we found at the destination end and following it back, we thought that perhaps it was due to improper handling in transit or in storage houses, or perhaps the difficulty could be traced clear back to the orchard. It was necessary to follow the history of the fruit from the market backward, to find out what factor that entered into this problem of handling was to blame for this considerable loss—a very large loss, in fact. During the time that Mr. Powell and Dr. Taylor were personally associated with this work, they took this method of attack, following the crop in this way from the point of delivery back to the orchard and, strange to relate, they found that the cause of the trouble was in the orchard; that the fellow who picked the fruit off of the tree was to blame for a very large proportion of this decay or loss, which was only observed after the fruit reached the market. It was a matter then of readjusting the conditions of picking and handling in order to overcome this difficulty.

Mr. HAWLEY. What had the picker done with the fruit?

Mr. CORBETT. The picker had left too long stems, and had used too sharp-pointed a clipping device, which had punctured the fruit and broken the skin, making it possible for organisms of decay to enter and break down the fruit. Blue mold was found to be the chief cause of the difficulty. If the texture of the surface of the fruit is kept intact, this organism can not enter. It is not a parasite but a saprophyte, which can only get into the fruit after the skin is broken. If the skin of the fruit is kept in perfect condition so that there is no opportunity for this organism to enter, it can be carried without loss. As is indicated on the chart, careful handling methods in the orchard and in the packing house made it possible to deliver Florida fruit with only a little over 4 per cent loss, whereas otherwise the loss would have been 20 per cent.

Mr. HAWLEY. Does that chart mean the whole crop from Florida?

Mr. CORBETT. No, sir; that relates simply to an experimental shipment. That is followed up by giving the people instructions in their packing houses and orchards. The total loss has not been reduced to this point [indicating], 0.04 per cent. This shows the possibilities, and, while there has been a considerable decrease in loss from this point [indicating], 20 per cent, it is actually between these two figures; that is, between the 20 per cent in the commercial and the 0.04 per cent in the experimental lots. The same type of work is carried on with other perishable fruits, particularly with grapes, berries, prunes, and cherries. There are, of course, details which enter into the handling of each of the products which make each one somewhat different from the others, because of the peculiarities of harvesting and packing. All those factors have to be taken into consideration, but, in general, the work is the same for all of them, and we find that the same general laws hold good.

Now, here is a farmers bulletin for the benefit of the Florida people, based upon this type of work entitled "Handling and Shipping Citrus Fruits in the Gulf States." Another is "The Handling and Shipping of Fresh Cherries and Prunes from the Willamette Valley." Another is called "Factors Governing the Successful Shipment of Red Raspberries from the Puyallup Valley."

Mr. HAWLEY. That is fresh fruit?

Mr. CORBETT. Yes, sir.

Mr. LEE. Suppose you give the numbers of the bulletins as you refer to them.

Mr. HOWELL. Are those published as farmers' bulletins?

Mr. CORBETT. Part of them are, and part of them are issued as technical bulletins.

Mr. HAWLEY. The citrus bulletin is Farmers' Bulletin No. 696, and the grape bulletin is Department Bulletin No. 331.

Mr. CORBETT. The storage work which is done under this same item has to do very largely with the case of fruits, with the storage of apples, apples being the one fruit which is most largely carried in cold storage in the United States. The storage work and the handling work is very intimately associated with the pathological work of this bureau, because it is necessary to have clean, disease-free products in order to keep them whole in storage. Products which have been badly handled in the orchard or during the process of picking and packing do not hold in storage as well as those that have been carefully handled. So that one of the great factors which has grown out of the storage investigations goes back to the orchard—to the point of the careful handling of fruit before it is placed in storage. Of course, as you know, varieties behave differently in storage, but we are speaking in general of the long-keeping winter varieties.

Mr. LEE. Now, can you get information as to the number of growers of these different fruits so that you will be able to send them these bulletins?

Mr. CORBETT. Yes, sir; we have large mailing lists of people actually interested in these subjects.

Mr. HAWLEY. How far can you ship red raspberries and how long will they stand in any condition without breaking down?

Mr. CORBETT. You can ship them several hundred miles and they will stand three or four days on the market in good condition.

Mr. HAWLEY. That is, after they are taken out of cold storage?

Mr. CORBETT. Yes; out of the refrigerator car. Our investigations show that it is possible to extend the distribution of the fruit several hundred miles farther by carefully picking only the hard ripe berries, putting them in boxes and handling the boxes carefully, even carrying them on spring wagons, which is a great factor in safe transportation of delicate fruits like berries.

Mr. ANDERSON. Can you do what you are proposing to do, handle them in a way that you propose, at an expense which would make it commercially profitable to handle them in that way?

Mr. CORBETT. Yes. Some of these investigations have very greatly reduced the expense in the matter of handling fruits. That is particularly true of the citrus fruits. The methods which the department has recommended have greatly reduced the cost of operation in the fields and in the packing houses, because they have simplified the methods in use. The old packing houses had a very complicated, intricate, and expensive system of handling fruits, which resulted in many injuries, which in turn caused losses from decay. By simplifying these processes and shortening them, it has resulted in reducing the cost of operation and in securing better-carrying fruit.

The CHAIRMAN. Take up the item of viticultural investigations.

Mr. CORBETT. These investigations are carried on under three subprojects. First, the Vinifera grape investigations, with 12 cooperative experiment vineyards in California; second, the Muscadine grape investigations in cooperation with the North Carolina Department

of Agriculture and private individuals; and, third, American Euvitis investigations, including the American bunch grapes in the Eastern States. The Rotundifolia or Muscadine varieties and the Euvitis varieties are native American grapes. The Vinifera grapes are European varieties, which are grown for raisin and wine production and for shipment from California to eastern markets. One of the interesting features of the Vinifera grape investigation is that connected with the saving of the industry, so to speak. The American industry, based on the European grape, was threatened in exactly the same way that the French industry was, by the phylloxera, and through the activity of the Department of Agriculture, very largely, all of the important resistant stocks, as well as a number of hybrids which have been produced in this country, have been introduced into the vineyards of California and, we believe, have been largely responsible for saving the viticultural interests of California from absolute ruin. These varieties are able to grow in the presence of a certain insect which lives upon the roots, and only those varieties which are able to withstand this insect are able to thrive.

The CHAIRMAN. Is that the same trouble you had in Pennsylvania some years ago for which a special appropriation was made?

Mr. CORBETT. No, sir. The American Euvitis varieties represent the American bunch grapes in the eastern part of the United States, and they are practically all resistant to the phylloxera.

Dr. TAYLOR. That was a different insect. That was, I think, the graperoot worm. That work comes under the Bureau of Entomology and I think they have been able to very largely reduce the damage done by that insect.

Mr. CORBETT. I simply mention these facts to show something of the importance of this line of work. The vineyard industry of California is a very large one, and it is very diverse, and is carried on on a very great variety of soils. The problem is that of determining the adaptability of these resistant stocks to the different soil types, and of determining the relative congeniality of desirable commercial varieties to different resistant stocks. So that the questions which we have to investigate are very complicated and very important ones.

Mr. HAWLEY. Have you made any investigations regarding the handling of the Tokay grape for shipment long distances?

Mr. CORBETT. Yes, sir; here is a bulletin giving the results of work along that line, Factors Governing the Successful Storage of California Table Grapes.

Mr. HAWLEY. That is Department Bulletin No. 35.

Mr. CORBETT. I was about to come to that in a moment. The importance of this resistance work and the question of adaptation and congeniality of these stocks is a very important one to the vineyard industry of California, and the Bureau of Plant Industry has been at work upon this subject for a number of years and has worked out to a very considerable extent many of these problems. The vineyard industry of California, the same as other industries, is constantly extending into new territory and bringing in new types, and, while we have the resistance and congeniality problem pretty well in hand for many of the standard commercial sorts, there are new varieties coming in all the time, some of which are better table grapes than any we have at the present time in common cultivation.

In addition to that, the currant of commerce, which is really one of the Vinifera grapes, is attracting a good deal of attention in California at the present time; so that the problem of finding congenial resistant stocks is a very important one.

The Rotundifolia grape or the Muscadine grape industry is of very great interest, because it practically establishes a new grape industry in the southeastern part of the United States. While the Scuppernong grape has been cultivated in a small way for many years, many problems have arisen in connection with its commercial cultivation. I am very glad to say that our investigators have been able to work out a plan of pruning and training this type of grapes which very greatly increases its productiveness, which is a very important matter for this section of the country. In addition to that, we have been able to produce some perfect flowered types of this grape. Normally, there are what we popularly term male and female vines, and it is necessary to have the staminated or male vine in the immediate vicinity in order to make the Scuppernong or other related varieties bear fruit. Some of our work has resulted in the production of perfect flowered varieties which give promise of fruiting as abundantly as the old standard sorts.

The CHAIRMAN. Is the Scuppernong a hybrid?

Mr. CORBETT. No; the true Scuppernong, so far as I know, is a natural species.

Mr. LEE. Have you a bulletin on the perfect-flowered type of Scuppernong?

Mr. CORBETT. No, sir; we have not published anything in detail on that up to the present time. We have a bulletin in the press giving the general cultivation of the Scuppernong.

Mr. HAWLEY. By the words "perfect-flowered," you mean having both stamen and pistil?

Mr. CORBETT. Yes; on the same plants. The American Euvitis investigation relates to the determination of the relative adaptability of native American grapes and their hybrids to the soil and climatic conditions of the various grape-growing regions of the northeastern United States, the determination of the value and uses of the several species and other varieties in these regions, and the development of new varieties and investigation of various methods of pruning and training them. We maintain an experiment vineyard at Vineland, N. J. The general principles of adaptation of varieties and pruning and training are the questions that are considered under this head. The grape-juice feature is also a very important matter.

The CHAIRMAN. What are you doing on this grape-juice business, Doctor?

Mr. CORBETT. We have published a bulletin giving general directions for the home production and home manufacture of grape juice. We have gone into the problem not so much from a commercial standpoint as for the home production of it for private use.

Dr. TAYLOR. Let me emphasize this feature a little, as it is rather a unique one in our experience. It became evident some years ago that the unfermented grape-juice industry was destined to attain much greater importance than it had before. The industry had rested primarily upon grapes planted for general use, rather than for juice manufacture, and the Concord grape, while succeeding in the Lakes region and in New England, is more sensitive to certain diseases than

certain of the more southern varieties. Cooperative work was therefore introduced in New Jersey with reference to a study of the adaptability of certain varieties of grapes to grape-juice manufacture, in an effort to get at what are the best sorts for grape-juice manufacture in a large way. The vineyard in New Jersey was established for that primary purpose. In that vineyard there are planted and maintained all the leading varieties of eastern bunch grapes, and a series of annual determinations of yield and juice behavior are being carried forward with a view to ascertaining whether it may not be advisable in our future developments of the viticultural industry to provide varieties especially suited for grape-juice manufacture. We believe that there are varieties that will make a higher quality of grape juice and that under favorable conditions will yield a larger production with less spraying and less risk and, therefore, result in a greater stabilization of this feature of the grape industry, which is a very important one, as under present conditions crop yields vary from year to year tremendously.

The CHAIRMAN. Doctor, in view of the sweep of the prohibition wave in this country, do you not think it is wise to get a little more kick into the grape juice?

Mr. HAWLEY. I have a solution to the chairman's problem. We raise what is known as the loganberry on the Pacific coast, and since some of the States have gone dry some of the breweries have gone into the manufacture of loganberry juice, which has the desired kick. Now, are you prepared, outside of that remark, which was made for the chairman's benefit, if those people should apply to you for information regarding the behavior of that juice when it is being prepared for the market, to give them suggestions or advice on that point?

Dr. TAYLOR. No, sir; we have not done any work on that. The Oregon State Experiment Station has done some excellent work on that problem and we feel that it is fairly well covered by that State activity. The loganberry does not thrive under our eastern climatic conditions. It originated on the Pacific coast, and it is ordinarily enormously productive there and is becoming commercially an important fruit in California, Oregon, and some parts of Washington, but we have not touched upon the juice feature.

Mr. HAWLEY. But you have done some work on the berry culture?

Mr. CORBETT. On the transportation feature; yes

Mr. HAWLEY. But have you done anything on the growth of it?

Mr. CORBETT. No, sir; not very much.

I might say that the effort at Vineland is to get the grape-juice business off of a single variety.

The CHAIRMAN. Your next item is the fruit-production investigations.

Mr. CORBETT. The fruit-production investigation covers what is outlined in the first subproject under this heading, the adaptability of fruit varieties to environment. This, as you will appreciate, is a very important matter from a commercial standpoint. The question of varieties which thrive best and give the highest yields of the best crops of the best marketability in any particular locality is of great importance, and for a number of years very careful regional studies have been carried on in connection with this problem. The people who prosecute this work go into definite areas and during the

fruiting season make most careful observations upon the general behavior of the trees and of the fruit that is produced in the orchards of that region. We do not plant orchards for this particular purpose, but we take advantage of the plantings which have been made for commercial and home use in the various regions, and the results are recorded in the bulletins which have been published upon this project.

Unless there are some questions I will go on to the fruit-cultural investigations, which have to do primarily with the securing of information regarding the best commercial practices in the various regions, with a view to reducing the cost of these operations and making them more effective in any particular in which the growers of the region may have failed. As rapidly as the studies upon any particular fruit are completed we make it a point to place the results of these investigations immediately before the public in the form of a popular bulletin, a type of which is represented by our series of Farmers' Bulletins Nos. 631, 632, and 633, which have to do with peach growing.

The CHAIRMAN. The next item is, "Cooperative dry land ranch fruit garden investigations."

Mr. CORBETT. As was pointed out in the discussion yesterday by Prof. Chilcott, the western dry-land farms are made available for cooperative activities by various offices of the bureau to the extent that they are able to take advantage of these opportunities. The question of providing a home supply of fruit for the settlers who have gone upon the Great Plains area is one that we are attempting to work out in the experiments that are now under way at these several cooperative stations, particularly at Akron, Colo., and at Amarillo, Tex. The Akron station has been in operation for several years, and we are getting valuable results from it, with the indication that we will be able to recommend the planting, cultivation, and treatment of trees, as well as varieties, which will insure these people a home supply of fruit and perhaps a little surplus for the local markets. We do not contemplate that there will ever grow out of this a large commercial industry because the commercial industry can be carried on to better advantage in other localities.

The CHAIRMAN. The next item deals with nursery investigations.

Mr. CORBETT. The problem involved in that investigation has in a measure been outlined in the discussions on the subject of viticultural investigations, particularly the question of the adaptation of stocks to various localities and the congeniality of these stocks to desirable sorts. The question of the roots under a tree is a very important one in regard to the soil to which that tree will be adapted, and also a very important one in regard to the behavior of the tree itself during its life. As you know, we use the root of the quince, for instance, as a stock for the pear to make it grow dwarfed, and under certain conditions it is possible to use the roots of one or another type of plant to make a tree better adapted to a local environment. As the fruit industry becomes increasingly important in the various sections of the United States this problem is constantly cropping up. In fact, only within the last few days the Horticultural Society of California, through the commissioner of horticulture, sent a communication to the Secretary of Agriculture asking cooperation along this particular line. In those districts where they have a great diversity of soil conditions this problem is a very important one.

The CHAIRMAN. The next item is nut-culture investigations.

Mr. CORBETT. The nut-culture investigations have, for the most part, up to the present time been concerned chiefly with the developing of the pecan industry. This work was inaugurated principally to study and determine, if possible, what were the possibilities in this field. Of course, we incidentally give a great deal of attention to the Persian walnut and to the native nuts, such as the chestnut, hickory nut, and black walnut. The two things, however, which are of most importance at the present time are the pecan and the Persian walnut.

Mr. HAWLEY. How long have you been investigating the Persian walnut?

Mr. CORBETT. Just about as long as we have had a Department of Agriculture, because the Persian walnut industry on the Pacific coast has been in existence for a long time, and the Persian walnut industry of the eastern part of the United States is attracting very considerable interest at the present time. However, the investigations along that line are merely a side issue, you might say. We have not been able to put as much stress upon that as might be.

Mr. REILLY. What other variety of walnut besides the Persian walnut have you developed?

Mr. CORBETT. There are many varieties.

Mr. REILLY. There is also an English walnut, is there not?

Mr. CORBETT. That is another name for the Persian walnut. The English walnut and the Persian walnut are one and the same thing.

The CHAIRMAN. The next item is for Mississippi Valley hardy-fruit breeding, $800. That is only a small item. Do you care to say anything on that?

Mr. CORBETT. It is true that it is a small item, but it has to do with one of the most interesting, though perhaps not one of the most important, economic problems that we have in fruit culture, namely, the working out of varieties adapted to the western side of the Mississippi Valley, extending up into our cold northern territory in the Middle West and extending south into the warm territory of the Middle West.

Mr. HAWLEY. That includes both the large and small fruits?

Mr. CORBETT. Yes, chiefly the tree fruits. We are not doing a great deal with small fruits, though we are doing something with strawberries.

The CHAIRMAN. The next item is fruit improvement through bud selection.

Mr. CORBETT. This project is what I call applying the Babcock test to the orchard tree. You are all familiar with what that means in connection with the dairy. In the orchard it means the working out and determination of the individual performance record of the tree We find that trees have individuality just the same as animals and men, and it is known that these individual characteristics can, to a very considerable extent, be transmitted to the progeny of the plant. It is therefore necessary, in getting an orchard or a plantation of trees which will yield the type, the quantity, and quality of fruit desired, to study the mother plants which are used for propagation purposes.

I want to show you just a picture or two to illustrate that point. I hold in my hand a picture of two types of navel oranges, both of

which are about the same size. This orange [indicating] is not unlike many oranges which you see upon the market, and this other orange [indicating], of course, is a superior orange; but when we cut these two oranges this is what we get. Here is a picture showing these two oranges cut in half. It is not a long story to convince the commercial purchaser of oranges which of those two is the more desirable for him, and the man who produces those oranges desires of course to produce what the market will receive best. The general appearance of the trees, the general appearance of the fruit on the tree, to the casual observer, is not very unlike, but, to one who has given the matter study and attention, these problems of growth and of the appearance of the fruit, and so on, become very apparent, because after cutting a few fruits it is possible to identify the trees without the fruit and tell which tree produced the desirable orange, and in like manner one can determine which tree produced the undesirable and inferior type of fruit. The question comes down to one of nursery practice or choosing bud wood from the trees which bear only the best type of fruit. Heretofore a common nursery practice has been to go into a good bearing grove, cut bud wood, and propagate the trees from that. The result has been that a large number of inferior trees have crept into our commercial plantations, through no fault of anyone, perhaps, but they are there nevertheless. The question now is not only how to get those out of commercial plantations but how to prevent others getting in in the future, because the presence of unproductive trees amounts to a commercial loss proportionate to the number of such trees on the plantation. Some trees, in fact, are almost barren and, because they produce very little fruit, become the drones of the fruit plantation. Let me cite an instance of the results of the work that is being done in southern California in the citrus region. After the gentleman who is associated in this work, Mr. Shamel, had been working quietly for two years along this line, one of the large growers saw what he was driving at and, without any suggestion on our part, went ahead and top-worked 3,000 lemon trees in one plantation in one year simply to get rid of the unproductive trees.

Mr. REILLY. Are those two oranges shown in that picture of the same variety?

Mr. CORBETT. They are of the same variety, and this is very interesting because it is the California navel orange which was introduced into this country from Brazil by the Department of Agriculture and which has had a very important influence upon the entire citrus industry of California, at least 50 per cent of the California orange industry being based upon this one variety.

Mr. HELGESEN. Recently we have been getting a number of grapefruit which are absolutely seedless. Is there any hope of making navel grapefruit?

Mr. CORBETT. Oh, yes; we have one or two seedless varieties in southern California. I saw in the office yesterday a navel grapefruit which is the same as the navel orange in structure and which is also seedless.

The CHAIRMAN. The next item is rosaceous fruit breeding investigations.

Mr. CORBETT. That is a rather small item. We are not putting a large amount of money into this item, but it is very interesting from the scientific standpoint, because it is a work which we are prosecuting for the purpose of getting basic or fundamental principles on which to conduct breeding work on a more intelligent and far-reaching basis.

The CHAIRMAN. That is your investigational work?

Mr. CORBETT. Yes, sir.

The CHAIRMAN. The next project is investigations in systematic pomology.

Mr. CORBETT. The first item on the top of page 184, fruit-history investigations, is of importance, because it is very desirable both from a historical standpoint and because it is of great interest from the standpoint of future breeding work in pomology in order that we may know where and how and under what circumstances certain varieties have originated. In addition to that we are accumulating information regarding the early activities and early attempts at growing fruit in various parts of the country.

The next item is fruit-nomenclature investigations. The importance of this item is brought out in the fact that we attempt through cooperation with the American Pomological Society and the nurserymen of the country to keep the varieties of fruits true to name and to prevent confusion or duplication of names in the catalogues, so that a variety will everywhere be known under the same name.

Mr. HAWLEY. This work will be of additional importance in legislation that may be passed in regard to marketing of various fruits, standard-barrel measurements, etc.?

Mr. CORBETT. Yes, sir.

Mr. HAWLEY. You think this work will have considerable value in that connection?

Mr. CORBETT. Yes, sir. There is no doubt about that. It is important that the grower be able to correctly name the fruit he packs, for many laws relating to standard packages also cover marks or brands. The aim of this work is to assist the nurseryman to have the correct name of the variety as it goes out of the nursery, so that a fruit will not be known in one locality under one name and in another locality under another name.

The fruit-identification investigations are of very great interest to fruit growers. A great many specimens which are wrongly named are received from amateurs and commercial growers throughout the country, and, as they want to know the correct names, they send them to the department for identification. Specimens of the important commercial varieties of fruit are secured, if possible, from the original tree or from a daughter tree standing in the locality where the variety originated, from which to make descriptions, paintings, and models for record, and for the purpose of comparison in identification.

Mr. HAWLEY. If growers wanted to get a series of these paintings, could they get them by paying for them?

Mr. CORBETT. These would be so expensive that the grower could hardly afford to have them. We paint only those things which are of very great importance from a local standpoint or from the point of identifying the particular variety. This series [indicating], if you

[illegible] the standard in America in the United States.

[illegible] in addition to put these pictures in the bulletins for the farmers.

Mr. [illegible]. I think a valuable night be made if the 30 or 40 [illegible] which would be extremely useful to the farmers, [illegible] a comprehensive presentation of all the several [illegible] to be a compilation of [illegible] to reproduce [illegible].

[illegible].

Mr. [illegible]. The [illegible] make the one [illegible] that [illegible] can.

The [illegible]. The [illegible] investigations.

Mr. [illegible]. The [illegible] investigations have been [illegible] in connection with the Bureau of [illegible] and we are at the present time attempting to insert a [illegible] in the [illegible] to [illegible] more in line with the [illegible]. The problem here is to find [illegible] a large annual loss in fruit which occurs [illegible] will not be harvested the particular day [illegible] to market to which they would naturally go. These are what we can get away [illegible] they are a little too soft to go to the market; they are [illegible] and there is no market for it. The problem is how to take care of that product so that it will not be a total loss to the grower. The same is true of the large quantity of apples which ought never to go into barrels and boxes but which ought to be converted into some wholesome product which can be successfully marketed. The problem therefore is to find a means to convert these fruits into dry products, canned products—jellies, jams, ciders, and vinegars.

The CHAIRMAN. The next subject is horticultural investigations. The first item is vegetable handling and storage investigations.

Mr. CORBETT. That is the same type of work that we carry on under the item of fruit handling and storage investigations, except that we deal in this case with vegetables instead of with fruits, but the story is exactly the same. To make the story short, this chart shows what the people shipping lettuce in hampers from Florida under present commercial practices get when the lettuce reaches New York City. I can better explain it by this map [indicating]. This is the amount (40 per cent) of first-class prime lettuce that they are able to deliver in the markets under conditions which ordinarily obtain. By special field handling—not cultural factors at all, but merely the careful handling of the product at the time it is cut and put into the hamper so as to avoid carrying any decayed or diseased leaves with the product as it is packed in the receptacles—we are able to put 98 per cent prime material into the market. That involves careful handling of the product in the field and precooling before it goes into the refrigerator car.

The CHAIRMAN. Are the truckers following your methods?

Mr. CORBETT. Yes, sir; they are to a certain extent. This work is very recent work. It has only been carried on last year and the

year before, but the farmers are very anxious to get hold of it and put it into practice.

The CHAIRMAN. What you say about lettuce applies to other vegetables also?

Mr. CORBETT. Yes, sir, to a certain point. We have some interesting studies in connection with celery, and this problem also carries with it the storage of celery and root crops and other vegetables. In connection with the celery storage, by simply changing the size of the container that is used to store celery in the ordinary cold-storage house, we have been able to add 30 days to the storage life of the celery, and when you appreciate that you can extend the season of distribution 30 days beyond the end of the normal distribution season, that is a very large item, which means two things, either that you will get a considerable increase in profit or you are able to handle an increased load.

Mr. HAWLEY. Do you make the container larger or smaller?

Mr. CORBETT. Smaller, or we put a partition in the container. For instance, the ones that are made for packing New York and New Jersey celery are practically 22 inches square, holding about seven or eight dozen plants of celery packed very tightly in the container. These are then put in cold-storage houses and stacked five high. We find that such containers will not keep the celery as well as smaller containers, about half the size.

The CHAIRMAN. What is the principle involved, Doctor?

Mr. CORBETT. The principle is that the amount of material is so large and is packed together so closely that the cold-storage facilities are not able to reduce the temperature of the material in the container rapidly enough to prevent decay. The new plan is simply putting it in small units that will cool more quickly.

The CHAIRMAN. The next item is truck-crop culture investigations.

Mr. CORBETT. That has to do with the determination of the practices followed by the successful crop growers throughout the country and disseminating this information to others, and to assist, as far as we can with the limited forces we have, in solving the problems in connection with the great variety of truck crops that are grown along our Atlantic coast and Gulf coast, as well as in southern California. I might say that this work has resulted in the introduction of a new type of onion. Within the last few years we have found that we can grow the large Spanish onion, known as the Denia onion, in some sections of the country. Its culture is already established as a small industry.

Mr. HAWLEY. What is the advantage of the Spanish onion?

Mr. CORBETT. It is a very large, mild-flavored onion and sells for a high price. It can only be grown in the Southwest—in New Mexico, Arizona, and southern California. Another fact that is of interest in connection with this is that it has been found that the seed of this crop of apparently as good quality as the Spanish seed can be produced in this country, so that if the industry grows and we produce the seed in this country we will not be dependent on a foreign supply.

The CHAIRMAN. The next item is "Adaptability of vegetables to environment."

Mr. CORBETT. This work is of special interest in connection with the production of certain crops, as well as the production of seed for certain crops. The determination of the locality and the reason why

certain varieties grow in that region better than they do in others are of just as much importance in connection with vegetables as in connection with the fruit industry.

The CHAIRMAN. It is the same general line of work?

Mr. CORBETT. Yes; the same general line of work. The investigations are carried out in practically identically the same way.

The CHAIRMAN. The next item is "Truck-crop fertilizer investigations."

Mr. CORBETT. On page 187 there is a typographical error in the second line of the paragraph. The word "soils" should be "salts." The problem that we are attempting to solve under this project is to determine the proper use of fertilizers on truck crops. The practice in past years has been to use many applications of high-grade fertilizers, with the result that, in certain localities where the industry is very intensively carried on, soils that are practically reeking with plant food are not producing good crops. In other words, the plants do not seem to be happy under those conditions, and the problem is to find out what is the matter with them.

Mr. HAWLEY. Maybe they have indigestion.

The CHAIRMAN. The next item is peanut investigations.

Mr. CORBETT. This work has been under way for a number of years. This crop has been increasing in commercial importance very rapidly during the last decade. It has more than trebled its value in the last 15 years.

Mr. DOOLITTLE. How has its value increased and in what direction?

Mr. CORBETT. Largely through the extension of the industry into new territory and the introduction during the last few years of a new type of peanut, the Spanish type of peanut, which has become very important throughout the general peanut-growing sections of the country.

Mr. DOOLITTLE. For what purpose are the peanuts used?

Mr. CORBETT. Peanuts are used in a great variety of ways, both for human food and as food for all types of farm animals, from cows, horses, and mules to pigs and poultry. Some of our finest grades of ham are produced by finishing the hogs on peanuts. The producers of the familiar Smithfield hams claim that their flavor is due to the fact that the hogs have a certain ration of peanuts.

Mr. LEE. The peanut oil is very valuable?

Mr. CORBETT. Yes; it is very valuable, but until this year there has been no peanut oil commercially manufactured in the United States. Now we have some five or six mills that are giving considerable attention to peanut oil.

Mr. HELGESEN. Peanut oil is a substitute for what other oil?

Mr. CORBETT. It can be made a high-grade table oil comparable in quality and food value with the olive oil. It is very largely used in Europe and in this country, too, in the manufacture of oleos and oleomargarine. It is fine cooking oil, and we have been interested in attempting to get it introduced as peanut oil rather than as a substitute or counterfeit of some other oil.

Mr. LEE. That oil is now selling for 75 cents a gallon.

Mr. CORBETT. Yes; the better grades of it are.

Mr. OVERMYER. Have you found the hulls or shells useful?

Mr. CORBETT. The hulls or shells by themselves have very little intrinsic value. They have 4, 5, or 6 per cent of oil content and when ground with the whole nuts make a very fine stock food.

Mr. LEE. It is a good balanced ration?

Mr. CORBETT. When the whole plant—vine and nuts—are fed, it comes as near to a balanced ration for dairy cows as anything I know of.

Mr. LEE. Doctor, we have a department expert in Alabama, and he told me the other day that they discovered that there was an element in peanut oil that was used for making dyes for dyeing silk and that it was discovered that it was very valuable for that purpose—about the best dye that they could get.

Mr. CORBETT. That is very interesting. I am not familiar with that.

The CHAIRMAN. Take up the next item, investigations of the adaptation of truck crops to organic soils. That seems to be a small item, only $1,000.

Mr. CORBETT. Yes; but it is very much more important, in my judgment, than the statement in the book would lead one to believe. We have thousands of acres of land which are alluvial muck land or swamp lands which are being drained in various parts of the United States, which will make some of our richest and best agricultural land when the crops which are adapted to them have been determined. It is this type of work that we are interested in under this project. The question of the adaptation of crops which will produce a sufficient return to justify the reclamation and draining of these lands is a very important question. These lands do not ordinarily lend themselves to the cultivation of farm crops, and it is necessary to grow upon such land crops which yield a high return.

The CHAIRMAN. The next item is investigation of the commercial production of vegetable and flower seeds.

Mr. CORBETT. That is of very much greater significance to the people of the country to-day than it was a generation ago, for this reason: We have very large intensive industries based upon the seeds which are grown for the production of certain types of vegetables. The question of the value of seed for such industries depends on whether it will produce the kind of crop and the quality of crop desired For instance, in certain sections near our cities we have forcing industries under glass, where the expense of producing a certain crop will run into many thousands of dollars, and, if the seed which is used for the production of that crop is not exactly what it purports to be, the man will lose all the investment that he has put into the proposition in the way of fuel and labor to produce that crop, which entails a tremendous loss in the aggregate. So the problem is to work out types of plants which are preeminently adapted to the needs of these highly-specialized industries and teach the people how to grow the seed of these crops so as to insure themselves against loss.

The CHAIRMAN. The next item is standardization of commercial varieties of vegetables through selection.

Mr. CORBETT. That is along the same line, but it has to do with such crops as beans. The production of garden and field beans is a very important industry in the United States. During the last decade there has been considerable falling off in the acreage yield of field beans, and we have been interested in and are successfully developing

strains of beans which will be highly productive and will in a degree restore the acreage diminution which has taken place in beans. I simply use beans as an illustration, but we are doing that with other crops too.

The seed potato industry is one of the most important activities in our production work. It is, as you know, one of our leading commercial industries and storage is so very little common from which the best experiment stations or from the department until in recent years. I am glad to say that we are now making some progress. The problems are very varied and very important. Many of them involve the control of diseases and other factors of that sort which require the closest cooperation with the pathological investigations of the bureau to work out. The question of producing a high-yielding disease-resistant baking or boiling potato adapted to special localities is of prime importance. It is problems of this sort that we are interested in and which we feel that we have made considerable progress.

Mr. Anderson. Have you any information as to the relation between soil and climatic conditions and the ordinary potato scab?

Mr. Conners. No; I would not say we do. The investigations of the bureau have been chiefly directed to the controlling of scab through seed treatment.

Mr. Hersman. Is the scab carried in the soil so that the succeeding crops will be affected?

Mr. Conners. To a certain extent it is, but not to the same extent as some other diseases. The ordinary scab in the East can be very largely controlled by treating the seed.

Mr. Hersman. How do you treat the seed? What do you treat the seed with?

Mr. Conners. We use either corrosive sublimate or formaldehyde.

Mr. Lee. Is that the trouble you had with the Maine potatoes?

Mr. Conners. No, sir; that was another type of scab. That was the powdery scab.

Mr. Lee. Can you control that in the same way?

Mr. Conners. We have not worked that out altogether.

Mr. Hersman. What is the effect of the use of small potatoes for seed?

Mr. Conners. That is a very interesting question and one that we have not very fully worked out, but we feel that we are on the road, so to speak. I was just looking over some statistics only day before yesterday which gave the yields from potatoes from 2 to 6 ounces in size, planted whole and cut in half and in quarters. It was found from some two or three years' work which had been conducted that a whole potato weighing between two and three ounces gives the highest yield, or a large potato cut into pieces each weighing between two and three ounces will give the largest and best results.

Mr. Helgesen. The crop in North Dakota last year was the poorest we ever had. One farmer could not sell them last year, but this year instead of cutting each in pieces, he planted them whole, large and small, and had the only big crop there was. I do not know but what that was the reason.

Mr. Conners. In certain localities experience goes to show that it is desirable to plant whole potatoes rather than cut potatoes.

Mr. HELGESEN. Will whole potatoes stand more frost in the spring than cut potatoes?

Mr. CORBETT. I can not answer that question; I do not know.

Mr. STEELE. The object of the large potato is to furnish moisture until the roots get started.

Mr. CORBETT. Yes; not only that, but to give the young plant a stronger send-off—a more vigorous push.

The CHAIRMAN. A kick.

Mr. LEE. Then you mean that the small whole potato will stand the frost better than the cut potato.

Mr. HELGESEN. Yes.

Mr. CORBETT. I think either one would be susceptible to frost.

Mr. HELGESEN. That has not been our experience. They seem to have more strength in the seed.

Mr. CORBETT. They have more eyes from which sprouts may develop if the first ones are killed.

Mr. HELGESEN. And smaller ones.

Mr. CORBETT. In other words, you have a reserve in the bank to draw on.

The CHAIRMAN. Doctor, is there anything further you care to say?

Mr. CORBETT. Not specially.

Mr. ANDERSON. I notice that some of the seed houses are selling the eyes for planting purposes. Is that a good practice?

Mr. CORBETT. That is a good practice only if you have a very limited supply of a very rare variety. I would not say that it is good practice for ordinary commercial work, but in case there was a great scarcity of seed for any reason, I think it has been practiced, as in certain cases where famine conditions have existed. In such cases people have maintained their potato crop to a certain extent by saving the parings or very small portions of the potato for planting purposes, but in ordinary practice it is not desirable because the piece that is planted should weigh about 2 or 3 ounces.

Mr. HELGESEN. In planting eyes you would have to be careful about the soil conditions before you plant them, because the soil must not be too hot or too cold or too dry.

Mr. CORBETT. Yes; that is right.

The CHAIRMAN. The next item is vegetable history and nomenclature investigations. I suppose the title indicates the purpose of the work.

Mr. CORBETT. Yes. The following item, vegetable-utilization investigations, is practically the same project as that discussed under fruit utilization, except that we have hit upon two or three things that we think are very promising. For instance, the drying of sweet potatoes has a promise in it, and we hope to work out something along the line of the drying of Irish potatoes.

Mr. HAWLEY. That is by means of an evaporating process?

Mr. CORBETT. Yes.

Dr. TAYLOR. Just at this point, Mr. Chairman, it should be clear in the mind of the committee that the relation of the fruit utilization and vegetable-utilization projects to the work of the Bureau of Chemistry is a cooperative relation, the two bureaus working simultaneously in order to accomplish the most that is possible from the two points of view. That question may come up in connection with this project.

The CHAIRMAN. Since you have raised the point, Doctor, it seems to me that in both of these items there should be some cooperation between your bureau and the Office of Markets and Rural Engineering on the work.

Dr. TAYLOR. As soon as a product reaches a point of delivery, wherever practicable, it is contemplated that a cooperative relation will be established between the two bureaus.

The CHAIRMAN. All right.

Mr. COBURN. The next project is landscape-gardening investigations. This is primarily intended to do two things: To work out simple planting plans which can be offered to rural people for the beautification of the farmstead, and to supplement these with lists of plants, both annuals and perennials, including shrubs as well as herbaceous plants, which can be used to make the surroundings of the home more beautiful and attractive—to make a real home in the country, as Prof. Chilcott pointed out; and, secondly, to make the surroundings of the various experiment stations which the Department of Agriculture maintains more attractive, and to offer to the schools that teach agriculture some assistance in making their surroundings more attractive, so as to inculcate into the minds of the young people who attend these schools the idea of making their homes and the towns in which they live more attractive. In other words, we Americans have reached a point now where it is not entirely a question of bread and clothes; we ought to begin to live, and this will help us in that department of our existence.

The next item is floriculture investigations, which I think I can discuss with the last item of this project, the greenhouse investigation, on page 191. The floriculture investigations of the department are as yet very, very meager. We are attempting merely to find out some of the fundamental problems in connection with the propagation of the plants which are very extensively used in our floriculture industry, which, you may not know, produce an annual return of something like $34,000,000. The question of the selection of propagating material from which to grow roses which shall produce profitable crops is just as important, from the florist's standpoint, as the question of the production of high-producing fruit trees, or high-producing cows, from the dairyman's standpoint. Under our greenhouse investigations we have, to use an office term, "headed into" a problem that is of great economic importance. When I say that the coal pile which the gentleman who maintains a flower or vegetable forcing establishment has to purchase each year constitutes his greatest financial outlay, you will see the importance of this question, because this has to do with an analysis of the equipment which this man uses in such a way as to determine whether he is getting the highest returns from his investment in the fuel which he uses. In other words, we are making a study of the greenhouse equipment of the United States with the idea of finding out those which are most efficient and why they are most efficient; finding out those which are least efficient and why they are least efficient, and placing all these facts before the people, so that they will have information which will enable them to remedy their losses. We have found that, in the study of some 3,000 plants in the last 18 months, there is a difference of 85 per cent in the expense for heating a thousand square feet of glass in the different plants which are used by florists, all competing in the same general market and all trying to sell their

products at a profit. You can see the handicap of the man who is not getting the proper results from his fuel, as compared with the one who is getting high efficiency.

The CHAIRMAN. The next two sections are very small, the first being bulb-growing investigations and the other nursery investigations. Do you desire to say anything about those items?

Mr. CORBETT. The bulb-growing industries are a small item in this particular appropriation, but this has to do with a project which has been under way for several years; that is, the production of Holland bulbs in this country. We have at Bellingham, in the State of Washington, a bulb garden where the bureau has been working for a number of years on problems connected with the production of the Dutch bulb, hyacinths, narcissus, tulips, and so on. The production of tulips and hyacinths is the work of especial interest under this item. There are, however, other features of the bulb work in the United States which we hope to be able to take up in a much broader and a much more important way. For instance, there is a very large annual importation of bulbs for forcing purposes for the production of Easter lilies and flowers for Easter. The bulbs are entirely produced outside of the United States, and there is about a 30 or 40 per cent loss by reason of the fact that they are not strong enough or disease-free enough to produce commercial flowers. The high price of the bulbs, the cost of forcing, and the high proportion of bulbs not producing salable flowers make the cost of such flowers unreasonably high.

Mr. HELGESEN. How many dollars' worth of bulbs are imported annually into this country?

Mr. CORBETT. Not so many dollars' worth of Easter lilies.

Mr. HELGESEN. I am talking about bulbs in general.

Mr. DORSETT. I am informed it is something over $2,000,000.

Dr. TAYLOR. The feature in connection with the general bulb question is this, that these bulbs constitute the basis for an intensive industry which requires a very large expenditure for fuel and labor and other elements of cost before the product is available for the market. Of course, in contrast with wheat and potatoes, it is rather small, but the bulb constitutes the bedrock of an important flower industry.

Mr. HELGESEN. In your opinion, what percentage of this $2,000,000 worth of bulbs could be produced in this country?

Dr. TAYLOR. We see no reason why a very large proportion of it should not be eventually produced here. We have the widely varying conditions of soil and climate in this country, and we believe that the American horticulturist has a capacity to handle a production enterprise of this kind after the general principles are worked out. It is difficult, however, for him to get a start if he is without the experience that has been accumulated in the older countries.

Mr. HOWELL. What is the approximate value of the home-grown bulb?

Dr. TAYLOR. The home-grown bulb production is very small, except the summer flowers, like dahlias, gladiolus, and narcissus. There is a small though thrifty narcissus industry in the Norfolk region.

Mr. HELGESEN. The fact that any industry is small, if it has a possible growth, ought not to work against its being supported by the Government. As an illustration, North Dakota is an agricultural State, though nobody thinks of it as a manufacturing State. If you went there you would not know there was a factory there unless it

[illegible]

Mr. [illegible]. I think I have the right idea of that.

[illegible]

The CHAIRMAN. [illegible] your statement, Doctor?

Mr. [illegible]. [illegible] the Arlington farm.

The CHAIRMAN. [illegible] items 94 and 95, and now desire to discuss the Arlington farm.

Dr. TAYLOR. We might take up item 97, as these are all r similar, if it is agreeable to the committee.

The CHAIRMAN. All right.

FURTHER STATEMENT OF DR. WILLIAM A. TAYLOR, CH OF THE BUREAU OF PLANT INDUSTRY.

Dr. TAYLOR. Item 97 is to cultivate and care for the gardens grounds of the Department of Agriculture in the city of Washing is the item under which we maintain the grounds of the departm exclusive of the buildings, including the greenhouse facilities, w are necessary in connection with the investigational work o department. The appropriation last year was $11,690. We no increase of appropriation this year, but the estimate provide a change of the language which will clearly authorize in this parag the keeping and lighting of the grounds, the construction, surfa and repairing of roadways and walks, and the erection, manager and maintenance of conservatories, greenhouses, and plant and propagating houses on the grounds of the Department of Agricu in the city of Washington. In so far as the keeping and lighti the grounds is concerned, this represents a concentration in subappropriation of authority that has been divided between subappropriation and the item for miscellaneous expenses o Department of Agriculture, which is found on page 167 of the mates. The item is No. 1 on that page. The word "grou which has occurred in that item has been in conflict with the auth of this paragraph "to cultivate and care for experimental ga and grounds." It has appeared advisable to clear up that co and concentrate the expenditure and authority here. That i sole purpose of the change of language, except as to the authori erect conservatories, greenhouses, and plant and fruit propag houses.

I might say that until last July the erection of such greenhous were necessary from time to time has proceeded under an pretation of the comptroller which recognized those structur temporary structures and therefore not subject to the pro against tion of public buildings except where specially au ized nection with the erection of such a building d

this present fiscal year the comptroller wrote a letter under date of July 19, 1915, to the Department of Agriculture, and I think if I read one paragraph from his ruling it will make it clear to the committee.

The CHAIRMAN. Is there any objection to the entire decision going into the record?

Dr. TAYLOR. No, sir. In fact, it would help to a full understanding of the opinion.

The CHAIRMAN. I ask that that be inserted in the record.

(The letter referred to follows:)

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE TREASURY,
Washington, July 19, 1915.

Mr. A. ZAPPONE,
Disbursing Clerk, Department of Agriculture.

SIR: I have your letter of June 30, 1915, submitting for decision as to your authority to pay the same a voucher in favor of Charles A. Barker in the sum of $981 for "Erecting quarantine inspection house at Twelfth and B Streets NW., Washington, D. C.," payable from the appropriation "General expenses, Bureau of Plant Industry, 1915," it appearing that this amount is a partial payment on a contract amounting to $1,635.

Although the erection of similar buildings, temporary in character, has been authorized from the appropriations containing no specific authority therefor, when it was shown that they were necessary to the accomplishment of the purpose of the appropriation, there is grave doubt as to the propriety of extending the rule so as to cover the present case and if submitted to me in advance of contract I would hesitate to authorize it, but upon investigation it appears that the building is very similar to some which have been regarded as temporary in character, that it is absolutely necessary to the proper accomplishment of the purposes of the appropriation, that the contract was entered into in perfect good faith in the belief that it was authorized under former decisions of this office, and the contractor has partially performed his contract. All the circumstances call for liberality of treatment and I have concluded that it is my duty to advise you that the voucher in question may be paid.

Respectfully,

GEO. E. DOWNEY, *Comptroller.*

Dr. TAYLOR. So that what we desire is unquestioned authority with reference to the expenditures which we have been making for several years out of this paragraph.

The CHAIRMAN. Doctor, I do not think it is necessary, unless the committee desires to ask some questions, for you to go into the line of work that you are doing. It is greenhouse work and testing work as explained by the item itself. We will take up now the Arlington Farm work.

Dr. TAYLOR. Under item 97 comes the Arlington Farm work. The Arlington Farm, across the river, constitutes our farm laboratory. It is used by the investigational officers both of the Bureau of Plant Industry and of the other bureaus just as the greenhouses upon the department grounds represent the plant laboratory facilities indoors. Upon Arlington Farm such plant collections are maintained as are required, such field experiments are prosecuted as the area permits, and it constitutes therefore the out-of-door laboratory conveniently near to Washington for the entire department.

The CHAIRMAN. How many acres of land have you over there?

Dr. TAYLOR. Originally, we had about 300 acres. That has been increased during the past few years by reclamation work done by the War Department in connection with dredging of the channel of the river, the soil of that dredging being deposited on certain adjacent areas, which will make available for use land which was previously unsuitable to the extent of some 70 acres.

[illegible]

[illegible]

[illegible]

ave an agricu y founded upon the broadest
ssible basis.] wi we take of this work—and it
the point of \ ll take, I think, who travels
telligently over the world—is not know that we have the
oadest basis. You will fin nt crops grown in all these
fferent countries, and that is t that plant introduction from
reign countries was begun.

Now, the Office of Foreign Seed and Plant Introduction merely represents the systematization or the making of a Government machine by which that work can be acc plished with the least expenditure, the least waste of public funds, d with the greatest efficiency. The keynote of this whole introduc n work is the bringing in of all the plants which in our opinion ought to be in the country, so that as time goes on we will be able to develop whatever industries can be made out of them. You have listened to the reports of a large number of experts who have given you the figures with regard to the yields of wheat, barley, and oats and all of these crops which have been introduced. Now, the financial profits of this work are mostly represented in the investigations of those specialists of the department who have taken up these different introductions and worked them out. Mr. Carleton was one of the first explorers in this line of departmental activity, as was also Mr. Hansen. These introductions have started the lines of investigation which have now worked out and completed the financial end of the matter.

Our office is not only a machine to introduce these things, but to distribute them, and the distribution work of this material is something that I thought the committee would be interested in finding out. There are scattered over the country a good many experimenters, as you know. The agricultural experiment stations are all equipped with experimenters. There are a number of private experimenters and private stations and private individuals scattered all over the country who are by instinct real investigators. You know they are not all gathered in the official stations of this country.

The aim of this work is to bring in as cheaply as possible as many of these new plants as are likely to prove of interest or value to begin with, propagate them, and put them in the hands of experts. Now, it would be a very easy matter to bring in a new plant with a doubtful possibility and give it a wide distribution throughout the country, but that would be a wasteful method. What we do is to get in touch with the real experts.

I will pass around among the members of the committee this exposé of our introduction work. It will be very interesting. Now, it is not enough to bring in plants and send them out. They have to be all carefully described and labeled and identified and specimens kept of them, and photographs taken of them so that we will leave some trail behind as to the work that has already been done. The trouble with the early work of the department was this:

Material was brought in and reports were lost. It will take you some time to discover even the records connected with the introduction of the navel orange, which was introduced only in 1870. So that in the first item of my appropriation list you will find that we are spending $30,000. This $30,000 is spent on this machinery in the department. Not only must this machinery be for the purpose of keeping records, but there has grown up since the work was first

started in this country a very decided opinion in regard to the dangers of introducing diseases. When we first started into this work we were not confronted, as we are at the present time, with those difficulties. They have grown tremendously—so much so, in fact, that it is no longer a perfectly safe thing, according to the experts who are studying these diseases, for any one living in a citrus region, for example, to send out to China to one of his missionary friends and bring in a few cuttings of a citrus plant. It is a very dangerous thing, because in these out-of-the-way parts of the world diseases exist about which we know nothing. The introduction of those diseases may cause millions of dollars worth of damage in this country.

I do not know that you realize that all of the work of bringing new material into this country is being concentrated through this office by the automatic action of the Federal Horticultural Board. I do not refer to large commercial shipments from countries where the pathology of the plant is well known, where they have inspectors, and where it is comparatively safe to bring the material into this country, but I mean this miscellaneous material of a more or less doubtful character brought in by private individuals.

Mr. REILLY. Do you mean that the inspection in other countries of these large shipments has been found satisfactory and safe?

Mr. FAIRCHILD. How safe that is is a question that I will refer to your hearing on the Federal Horticultural Board.

Mr. REILLY. Did you not express an opinion that it was satisfactory now?

Mr. FAIRCHILD. I did not express such an opinion.

Mr. REILLY. I misunderstood you.

Mr. FAIRCHILD. But I imagine that, in a number of cases where the nurseries are well known and the foreign inspectors are acquainted with their business, the danger is a very slight one indeed. However, that does not concern, except secondarily, this work of which I am speaking. The amount of material that we are bringing in is relatively very large, and it is all passing through a small quarantine house that has been erected and which will have to be enlarged. This quarantine house has a special laboratory fitted up with appliances so that it looks more like a hospital ward, with its white tables and cement floors. The men are obliged to wear long white coats while on duty, and they handle these plants with as much care as the doctors in the hospital ward handle infectious cases.

Gentlemen, I confess that, although it has brought untold confusion and annoyance to the importer of plants who wishes to see a plant brought in and live, it is coming to be a real development of this plant-introduction program. After the plants have been brought in through this quarantine house they are sent to our gardens, of which we have four, for propagation. They are essentially propagation gardens. Early in the work of introduction we found that it was a wasteful procedure to bring in these plants in the form of seed and send them out in that way. The propagation of many plants from seed is a very difficult or technical operation particularly with tree and shrub seeds. So we were obliged to build up these propagation gardens, where we grow these plants in considerable numbers, from which points, after they have undergone the inspection by entomologists and pathologists, they are sent out to the experiment stations and to experimenters who are willing to spend their own

time and money on these new introductions, some of which are questionable and all of them risky so far as financial profits are concerned at the outset.

Mr. HELGESEN. Do private importations have to go through this laboratory of yours?

Mr. FAIRCHILD. Private introductions from foreign countries which have not inspection laws are not accepted by the Post Office Department. This is the method which we adopt: If an experimenter wants to get some foreign plant which is new, his letter generally comes over to us complaining that he can not get this plant in because there is no inspector in some port in China, say, and we will introduce that plant and place it in his hands.

Mr. HELGESEN. After all, then, you would have to depend on the efficiency of the foreign inspection rather than our inspection, in so far as a disease or anything else is concerned?

Mr. FAIRCHILD. Oh, yes. In the case of small plants from out-of-the-way countries, the Post Office Department will not receive them.

Mr. HELGESEN. You say they are inspected in a foreign country and you will have to depend upon their inspection?

Mr. FAIRCHILD. Yes, sir; that is, in cases of these well-regulated countries that are recognized by the Federal Horticultural Board, but many countries do not have inspection boards.

Dr. TAYLOR. In the case of material that is of a character which is likely to produce destructive diseases, as, for example, citrus material at this time, there is a prohibition based upon the plant quarantine act against the entry of such plants or seeds from foreign countries. Hence the only citrus plants that can enter the United States at the present time must come through the department, so that there is an effective shutting out of new citrus diseases.

Mr. HELGESEN. But, after all, that regulation does not apply until after they have discovered that a certain plant carries disease, and then you are locking the door after the horse is stolen.

Mr. REILLY. As I understand it, one of the reasons urged for the enactment of the quarantine law, the law under which the quarantine board was established, was that certificates of inspection made in foreign countries and issued in foreign countries were altogether unreliable in this country. Now, it would seem that if the quantity of a shipment is large the certificate is accepted as satisfactory, but if the shipment is small the certificate is rejected.

Mr. KELLERMAN. Mr. Chairman, I would like to interrupt to say that I think these points could be more effectively discussed at the time the estimates for the Federal Horticultural Board are considered. As a member of that board I can assure this committee that the large commercial agricultural shipments do not come through this small departmental quarantine house. This small quarantine house is for their own plants, except in case of the occasional introduction of small quantities of quarantined material for specialists of other institutions.

The CHAIRMAN. I think the point is well taken.

Mr. REILLY. Evidently I am butting in at the wrong place, but I would like to have some explanation made of that matter at the right place.

The CHAIRMAN. Doctor, if you will permit me, the committee is, of course, interested in the machinery by which you get your plants

, if I brought in here and showed you and you could smell it, ps two out of every three would shake your heads and wonder er there was really anything in it or not.

have discovered, however, that there are 150 or 200 varieties se mangoes. We realized from our investigations in India that are some perfectly delicious varieties, that they are excellent rs, and that they compare very favorably with peaches or pears—they are as good shippers as the Bartlett pear. Now, are in southern Florida and possibly in southern California of land where they can grow these mangoes, where they are ng them, and where there are orchards being planted. This has all grown from the stimulus given to it by the Depart- of Agriculture.

CHAIRMAN. How large an area is that, Doctor?

FAIRCHILD. It is scattered; it would be very difficult to esti- just how large an area could be covered by the mango. It is sistant to frost and would not cover a very large area of the d States. However, it would affect the population of that very where the citrus canker is wiping out the citrus groves.

HAWLEY. Is it used in its raw state or is it cooked?

FAIRCHILD. It is used in the raw state, and is also canned and ved. It is a golden yellow fruit with one big seed in the e, and by cutting it around with the knife and lifting out the ou can then eat the flesh of the fruit with a spoon, much as ould a good ripe cantaloupe.

CHAIRMAN. Is it any kin to the avocado?

FAIRCHILD. It has no relation at all to the avocado. The do, now that you have mentioned it, is perhaps as far along as f these fruits in their exploitation. There are now probably in ighborhood of 600 acres of the avocado; and the interest in ruit is so great that they organized an avocado association thern California last summer and have petitioned the depart- to send an expedition to Guatemala to secure the different ies of the avocados which are known to grow in Guatemala and are hardier than the avocados of the West Indies. They have ker skin, they ship much better than the thin-skinned ones, e trees are very productive: and, what is more, they ripen in nter season. If you will go to any of the fancy-fruit stores in ngton you will find that there are now no avocadoes to be had. st ones, which came on in December, sold for 75 cents apiece. till in the fancy-fruit stage.

HAWLEY. Have they any use except for salad purposes?

FAIRCHILD. They are used only as salad fruits. They are nt in their food value from almost all of the fruits that we they are more nearly like the ripe olives. The Guatemala ies which have been analyzed have been shown to contain 20 to 30 per cent of oil. That is a perfectly remarkable thing you come to compare it with other fruits and when you con- hat that is still in the wild seedling stage and that in none of countries have they undertaken to bud and graft and select varieties as we are selecting them in Florida and California. ve a hundred or more varieties of the avocado, and yet we know that we have the best types that are to be had. Yet very old fruit and probably might have been known to the so far as that is concerned.

So we feel that in the investigation of such a crop as this, a tree crop, a crop which produces large quantities of fruit, a taste for which has already become established, there is a great possibility. These Guatemala types have proven to be as hardy as lemons in southern California. The industry has unquestionably gotten far enough along so that it should be given substantial support.

The CHAIRMAN. Now, Doctor, take up some other introductions that you have made?

Mr. FAIRCHILD. Another new introduction, which is probably one of the oldest food crops in the world, and yet I doubt whether any of you ever heard of it, is called the dasheen. I have here a sample of it which I would like to show to you. It is something in which we are taking an experimental interest. It is drier than the potato, containing more starch and more protein than either the sweet potato or the ordinary potato, and it grows on land which is too wet for the Irish potato. What I wish to bring out here is that when we go into one of these new industries we never can tell beforehand just exactly where it is going to land or what are its limitations and possibilities.

The dasheen has been grown so long in tropical countries that it has lost its capacity to reproduce seeds, which indicates to us that it is a very old plant—old in culture. The yields which were obtained in Porto Rico and the West Indies were very large, indeed—up to six and seven hundred bushels to the acre. We are growing these in Louisiana, Georgia, Florida, and the Carolinas, and, although it has not yielded so heavily, it has produced a better quality. We have grown the dasheen in sufficient quantity not only to send out to planters, but to distribute to the fancy vegetable handlers. And here is a feature of the work that it is really very important that you should understand. Taste in food determines in large measure the lines of agriculture that we are working on.

Mr. HAWLEY. That is what I wanted to know. Has this an agreeable taste, or do you have to cultivate a taste for it?

Mr. FAIRCHILD. Many people like it at once. I could easily bring a hundred people who would tell you that they are as fond of it as they are of the Irish potato. Now, that is a start. You might not like it. Neither would you have liked the tomato when it was first offered you, and probably you did not care for celery when you first ate it. But I want to bring out the fact that we are working not only at the cultivating end of these problems but at the taste end. If people did not care for rice, there would not be any rice grown; if they did not like corn, there would not be any corn grown, and the cultivation of taste and its effect on the agricultural possibilities is something that we are taking up in a small way in connection with the bringing in of all of these new things.

The CHAIRMAN. Does not this have large starch possibilities?

Mr. FAIRCHILD. It has distinct starch possibilities, but it is too good for starch. I would rather have one of these than that same quantity of Irish potato, and I am expressing the sentiment of a great many people who have become very fond of it.

Mr. HAWLEY. How far north can it be grown?

Mr. FAIRCHILD. It can be grown as far north as Washington, D. C., but will not produce any large quantity of tubers.

The CHAIRMAN. Do you have another introduction which you would like to call to the attention of the committee?

Mr. FAIRCHILD. I would like to call your attention to one very eresting industry and to mention a tree which is important—the od-oil industry—in connection with the development of the flax ustry. The statement was made in the committee that nothing been found to take the place of linseed oil. While that state- it is true, it is also a fact that in China, along the upper reaches he Yangtze River, there is grown a tree called the wood-oil tree he tung-oil tree. In 1905 we imported a large quantity of seeds his tung-oil tree and are now growing in Georgia, Louisiana, hern Florida, and the Carolinas small plantings of this wood-oil . Wood oil is the quickest drying oil known. It has come to take place in the trade of what was known as the kauri gum, which mined in New Zealand and the supply of which is giving out. import over $5,000,000 worth of this wood oil into America every , and it brings all the way from 6 to 12 cents a pound. Our inves- tion in this industry makes us feel that inasmuch as it is a tree and the nuts which it produces do not decay readily when they on the ground, and inasmuch as the stock can be allowed to run in e plantations, it is a valuable secondary crop for the South. It s up into the Carolinas. To supply this wood oil for the trade ld require an area of several hundred thousand acres. Although is a Chinese industry, it is practically a seedling industry. And n you go into the development of a new industry like this—I n when American horticulturists take up the development of a tree crop—all of the questions of budding, grafting, and selecting er producing strains come in, so that there is the distinct possi- y of increasing over and above what the Chinese get out of their d-oil trees the actual yields of the individual trees, and conse- ntly the yield of the oil. Further than that, it gives us control of industry. We never know when things are going to happen in a which would make it difficult to get at this oil.

nother interesting crop which is coming on is the Chinese jujube, ry drought-resistant and hardy tree, which will probably extend n the Southwest into Kansas and up the Pacific coast as far as ral Oregon. It will stand any amount of hot weather and ect. There are a large number of varieties of it—probably 300 00 different kinds in China, where it is grown in orchard form; the fruits not only have a flavor of their own, which is different n anything you have ever tasted, but when they are processed dates I could pass them around to you and I doubt very much ther you could tell the difference.

r. HAWLEY. What do they yield there? How do they yield?

r. FAIRCHILD. They are heavy yielders, and we have now in gardens at Chico, Cal., about 15 of the best varieties, which re propagating as fast as we can, and these will be sent to the rimenters and nurserymen. And I wish it understood that there conflict, there can be no possible conflict, between this work the work of the nursery trade. The nurserymen, I think, to a would back this work. They find it a very expensive thing ing in new things of this experimental kind. They make their y out of the sale of large quantities of plants. When we have iently started a new crop and distributed enough of these plants eate a demand on the nursery trade, we practically stop the bution and the nurserymen take it up. This photograph of

[illegible]

Mr. HAWLEY. Do you have to graft in order to get a good quality?

Mr. FAIRCHILD. We have to graft. We bring the buds over on bud sticks and then put them onto the seedlings. We have gathered seeds in the Capitol grounds here to produce the stocks.

One of the promising industries which we have assisted in developing is the growing of the oriental persimmon. It may seem strange to you that there should be anything in the persimmon. You are probably thinking of the southern persimmon, which, by the way, is not a bad fruit, properly grown. But the oriental persimmon is a very different fruit indeed. It ranks next to the orange in Japan as a money-making tree crop. It is not only used in its fresh state but it is dried, and the better quality of these dried persimmons compare very favorably with the peach.

Mr. HAWLEY. How far north will they grow?

Mr. FAIRCHILD. They will grow below the Mason and Dixon line, wherever the frosts are not too severe. We have tried probably the hardiest of all varieties; that is, the Tanopan, at Washington; and occasionally the tree will pull through, but as a rule it dies after two or three years.

The CHAIRMAN. How long does it take to fruit?

Mr. FAIRCHILD. They will fruit the fourth year. Here are photographs of trees in bearing at Brooksville, Fla.

The bamboo industry, on which we have done a great deal of work, is one which has brought us some criticism. Everyone asks the question in regard to the bamboo, as to how it can be used. They say that oriental labor is so cheap and basketwork in China and Japan costs almost nothing, and the question of cost is a very pertinent one, as to how Americans can use this bamboo. Investigations which have been carried on by Mr. Frank Meyer and myself at different times in China Mr. Meyer has just returned from three years in central and western China indicate that the bamboo in the regions where it will grow throughout the Gulf States and California is a very handy plant to have upon the farm. When we first began the introduction of it, in 1902, we questioned whether the large species could be grown in this country; but the evidence now is conclusive that the largest of these Oriental bamboos can be grown wherever soil conditions are suitable all through the South.

Here is a picture of a clump [producing photograph]. I think it is 50 feet high. It is not far from Savannah. There are clumps equally large in Louisiana and in California. And there is no reason why, since the bamboo can be propagated very readily from a small rhizome cutting only 6 or 8 inches long, groves of this bamboo should not be started all through the South.

The CHAIRMAN. How large is that bamboo -that one to the left [referring to photograph]?

Mr. FAIRCHILD. That is a very old clump, planted twenty-odd years ago, brought by a private individual into Savannah.

Mr. HAWLEY. How large is the largest tree?

Mr. FAIRCHILD. Fifty-five feet high.

Mr. HAWLEY. About how thick?

Mr. FAIRCHILD. They are about 14 inches in circumference and between 4 and 5 inches in diameter. That photograph which I passed around—that one of the grove—will give a very good idea of a grove that is now growing at Bakersfield, Cal.

Mr. HAWLEY. What do you propose to do with this? What economic use will be made out of it?

Mr. FAIRCHILD. The same kind of economic uses to which the bamboo is put in the Orient will apply in part to the farms in the South. That is, it is a kind of hollow, woody material which will make temporary irrigation pipes, and you can split it and make stakes of it. It is an excellent thing for light ladders, thrown together in a hurry, and for supports for fruit trees, vine sticks, chicken coops, and all sorts of small uses for which the farmer now has no material.

Mr. HAWLEY. Could it be grown in the Willamette Valley, so that we could use it for hop poles?

Mr. FAIRCHILD. Quite likely. I noted a small clump, which I had not known anything about until this summer, in central Oregon, which I am investigating just now. It will grow in Oregon and up into the State of Washington.

The CHAIRMAN. Take up another line, please.

Mr. FAIRCHILD. The date activities have been handled by Mr. Swingle. You realize that the foreign end of this work was done by Mr. Swingle from the appropriation for this office, just as Mr. Carleton handled the introductions of durum wheat.

Mr. HOWELL. Are you still working at the introduction of the bamboo plants?

Mr. FAIRCHILD. Certainly.

Mr. HOWELL. After 20 years?

Mr. FAIRCHILD. Certainly; we would work at them for 50 years, if necessary; that is, the actual amount of money we put into it is very small. We keep this bamboo grove in Florida from which we propagate and distribute.

Mr. HOWELL. It has been demonstrated that the plant can be successfully grown in this country?

Mr. FAIRCHILD. But no one can get the plants to grow; that is the difficulty. I should have explained it. That is a very important point. After a bamboo grove has become as large as this [showing a photograph of a bamboo grove] it is extremely difficult to get any good plants from it. If you wanted to get one of those plants, you would have to dig up a clump about 3 feet in diameter.

Mr. HOWELL. But where you have the object lesson in any community or district, is that not sufficient to encourage the propagation of the plant after that?

Mr. FAIRCHILD. Yes; but we have not gotten to that stage, sir. We are now in the midst of the distribution stage of small numbers of bamboo plants to men who are interested in its development. Of course, we have not yet secured all of the bamboos that will grow in this country. These are only a few of those that can be grown. These are some which we think are hardier than even the Japanese variety growing down at Brooksville.

The litchi is a Chinese fruit which is very popular in China, so much so that one of the great Chinese exporters in discussing it said that it was as important to China as the peach is to us.

And then the pistache industry. The foreign work on the pistache has been done by this office. Mr. Swingle is in charge of the project.

Mr. HAWLEY. Those are the small nuts we get at the fruit stands?

Mr. FAIRCHILD. Yes, sir. Another fruit industry in the South is the papaya industry. Papaya is a fruit tree which grows and produces the largest quantity of fruit in the shortest time of any plant that probably is known.

Mr. HAWLEY. How far north will it grow?

Mr. FAIRCHILD. It is a tropical fruit.

Mr. HOWELL. How far north will the pistache grow?

Mr. FAIRCHILD. The nut pistache will probably be confined to the southwestern dry States. A related Chinese species has been grown for several winters here; but a temperature of zero will likely kill it.

One of the most interesting pieces of work which Mr. Meyer has done was the discovery of what is known as the Chinese wild peach, which is used as a stock all over China for peaches, plumbs, apricots, and stone fruits generally. This has turned out to be an extremely hardy stock--hardy not only in the sense that it will withstand the cold, but also in regard to its resistance to drought and alkali. Here is a picture of a peach orchard in Iowa killed to the ground when the temperature reached—35° F., and this Chinese wild peach is standing alone, uninjured, in the field.

Mr. HAWLEY. Does it resemble our peach in flavor?

Mr. FAIRCHILD. Slightly, but it has very little flesh: it is a stock plant. Experimenters working with orchard crops will all tell you that one of the most trying and one of the most important problems connected with the whole fruit industry is the question of stocks. We are experimenting with that on a considerable scale.

There is just one other feature which has not been spoken of, and that is the handling of the exploration work. That is the feeder to this other work and, with a few words in regard to it, I can close.

To send out an expedition of exploration means the putting into the field of a trained man or men familiar with our own agriculture. They travel into these foreign lands, looking for practices—that is, new practices, new stocks, new diseases of the plants, and, in fact, anything which has a bearing on the development of our own agriculture. The volume which I hold in my hand is Volume IV of a set of five which gives a brief account, with photographs, of an expedition which we sent to southern Brazil to investigate primarily, the navel-orange industry. That is the region where the Washington navel orange originated. It has become a big industry, and it was important to find out whether other varieties of the navel orange which they had down there would be superior to those grown in the United States. This expedition, consisting of three men, at a cost, altogether, of about $7,000, brought back not only definite data as to the orange stocks they used but also all the different varieties which could be obtained there, most of which material we are testing out in our different gardens.

Mr. HAWLEY. Did you get any new varieties of the navel oranges there?

Mr. FAIRCHILD. Yes, Mr. Hawley; and according to the expert, Mr. Shamel, it may widen the period of ripening of the navel orange. It will take several years to determine that, because, when you take

a plant from one country to another, you never know exactly what those conditions are going to do with it.

Among other things which came from this expedition into Brazil, was a variety of the Para grass, of which Mr. Piper, who will follow me, will give an idea of its possibilities in Florida.

(Thereupon, at 12.50 o'clock p. m., a recess was taken until 3 o'clock p. m.)

AFTER RECESS.

The committee reassembled at 3 o'clock p. m.

STATEMENT OF MR. C. V. PIPER, AGROSTOLOGIST IN CHARGE OF FORAGE-CROP INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Referring to item 99, "For the purchase, propagation, testing, and distribution of new and rare seeds," etc., you seem to have an increase there of $21,000 requested.

Dr. TAYLOR. Yes, sir; an actual increase of $21,000. Under this item we carry on our very important forage-crop investigations, including those which relate to the utilization of cacti; investigations bearing upon the development of methods of eradicating and controlling weeds; and the distribution of field-crop seeds, in distinction from vegetable and flower seeds, particularly of the forage-crop seeds, such as alfalfa, the forage sorghum, Sudan grass, and other crops.

Of the actual increase which is asked for, $13,470 is requested to take the place of the amount used on the investigational work on forage crops this year, which would be a net increase for the forage-crop work of $7,530. There is a proviso in this paragraph, as it stands, "that of this amount not to exceed $60,000 may be used for the purchase and distribution of drought-resistant field seeds throughout the Great Plains area and other dry-land sections of the United States." It was found impracticable to use the full $60,000 for this distribution without crippling the investigational work with forage crops which was already under way, and, after a very thorough consideration of the matter, the Secretary decided that it was not the intent of Congress to cripple that important investigational work, and that that should be protected, so that under this $60,000 proviso the amount used has been $46,530 for the distribution of these new and rare field-crop seeds.

A rather liberal interpretation of this proviso has also been had with reference to the character of these field-crop seeds to be distributed, as it was not considered that it was the intent of Congress to prevent or restrict the distribution of these useful seeds merely to the arid portions of the country.

It is suggested in the estimate that the language of the paragraph be changed in so far as the proviso is concerned so that it will read: "Of this amount not to exceed $60,000 may be used for the purchase and distribution of such new and rare seeds," that is the new and rare seeds as provided for in the introductory clause of the paragraph. In other words, this change of language is proposed in order that the department may have full authority to distribute these promising crop seeds in all sections of the country to the extent of $60,000.

[illegible] distribution that has [illegible] which primarily have been [illegible] with [illegible] particularly Sudan grass, which a [illegible] which now there [illegible]

[illegible] of the words, [illegible] that you are [illegible] a new and rare [illegible]

Dr. [illegible]. Sudan grass is a grass distribution. Sudan grass [illegible] years ago, in the form [illegible] as a new and rare seed in this sense [illegible] agricultural crop seed. [illegible] a good general distribution of what it appears [illegible] with these great or spective staple crops [illegible] their growth in this country.

Mr. Mc[illegible]. What about the particular parts of the country, if any in which the Sudan grass will do better?

Dr. Taylor. That we will feel out to an extent in this distribution of grasses, but I suggest to the committee that Prof. Piper discuss the forage-crop projects.

The Chairman. Yes. Before you do that I have had it in mind for a couple of years to learn if language which described the work more accurately could not be devised. Now, the Sudan-grass seed, in my judgment, at this time is no longer a new and rare variety. The department is introducing it, that is very true, but somebody has got to draw the line somewhere as between new and rare and ordinary seed. You would not call cotton a rare seed by any means, yet you might call Durango cotton seed a new and rare variety. I know that is true of corn and wheat of various varieties, that while in a sense they may be new and rare, in another sense they belong to the staple-crop family.

Dr. Taylor. In the Panhandle of Texas Sudan grass at this stage has passed beyond the new and rare classification, but through much of the important agricultural territory I think it has not, although it is rapidly taking its place as a stable and dependable forage crop in the more southerly portion of the great Mississippi Valley.

The Chairman. I suppose the true distinction would really be that this item covers the introduction of seeds that have not become widely distributed?

Dr. Taylor. Throughout the area which appears suitable to their production.

Mr. Helgesen. And to discover where they will grow?

Dr. Taylor. Yes, sir; and that is a very important feature for the farmer to know.

Mr. Helgesen. I sent some samples of Sudan grass up to within 6 miles of the Canadian line in North Dakota and it grew remarkably well and produced a magnificent crop; although it was frozen down after it came up on account of the early frost, yet it made a very fine crop. It may be a desirable grass. I do not know.

Mr. Hawley. I had one report in the valley that they had two cuttings and may have another.

Mr. HELGESEN. Did the department ever recommend brome grass?
Mr. TAYLOR. Yes, sir, under special and particular conditions.
Mr. HELGESEN. That is one of the things which is going to cost our
te millions of dollars—not the brome grass itself, but the trouble
it became mixed with quackgrass, and it has distributed quack-
s all over the State. The seed is so nearly alike that it takes an
ert to tell it apart, and now our people are skeptical about any
variety. We want to let somebody else try it first.
Mr. HAWLEY. Brome grass is all right, is it not?
Mr. HELGESEN. If only it is all brome-grass seed.
he CHAIRMAN. Mr. Piper, will you take up your line of work now?
Mr. HELGESEN. Since we have mentioned quackgrass, do you con-
r quackgrass can be easily removed from a field in case you want
et rid of it?
Mr. PIPER. Not easily, but we have conducted pretty extensive
stigations, and it can be exterminated without any great diffi-
y. I may add, incidentally, that about half of the timothy crop
ew England is quackgrass.
Mr. HAWLEY. And they get timothy prices for it?
Mr. PIPER. They get timothy prices for it. What few feeding
eriments have been conducted show that quackgrass is as good
imothy, except it ought to be cut a little earlier. Of course, it is
ry bad weed. I would not advise anyone to plant quackgrass
hay.
Mr. STEELE. Is it not very good pasture?
Mr. ANDERSON. Hog pasture?
Mr. PIPER. No.
Mr. HELGESEN. Did not quackgrass come to North Dakota in
seed of brome grass?
Mr. PIPER. I doubt that it was introduced with brome grass.
Mr. HELGESEN. I did not say introduced with it; I say it came
s.
Mr. PIPER. It more probably came with timothy or other grass
from farther east.
Mr. HELGESEN. How could it come with timothy seed? Timothy
very fine seed and quackgrass seed is as large as an oat.
Mr. PIPER. We find quackgrass seeds more or less in many of the
mercial seeds. You have to bear in mind that in practically all
Northern States from Wisconsin eastward the fields are more or
infested with quackgrass, and it has spread westward from that
itory.
Mr. HELGESEN. I do not see how quackgrass can come with tim-
seed if a man has any eyes at all. Is it not a fact that brome
s is at least the first cousin to quackgrass?
Mr. PIPER. It is not very closely related. The seeds do look a good
alike, and quackgrass seed is difficult to distinguish in brome
s seed.
Mr. HELGESEN. And the nature of the plants, too, is much alike?
Mr. PIPER. Of course, all grasses are much alike, but as grasses go
are not very closely related.
Mr. REILLY. Have you any bulletin on the extermination of quack-
s?
Mr. PIPER. Yes; we published such a bulletin a few years ago. I
k I have a copy of it here. The essential feature of the eradica-

[illegible] of quackgrass or any similar grass which has underground rootstocks is to practice it closely or to mow it for hay. Under such conditions the rootstocks become very shallow. It must be followed by shallow growing crops and the heavy use of it only by repeated harrowings. That is the essential principle involved.

Mr. [illegible]. I have heard a whole lot of remedies and they have all been wrong right up to the way and I do not know any of them that have been successful.

Mr. Piper. In connection with the occurrence of a lot of New England farms in very large areas of enormous quantity of quackgrass there. It is not easy thing to eradicate.

Mr. [illegible]. It is not hard to eradicate that if I were going to have the trouble with quackgrass and were going under what you say I would try the latter.

Mr. Piper. That is an almost parallel case with crabgrass in the South. The two grasses have almost identical habits of growth.

Mr. [illegible]. I had a very practical farmer at Chevenne Wells who was going to go down to Oklahoma and buy some of that sheep land. He said, I do not know Minnesota and get a carload of that quackgrass and plant it there.

Mr. McCormick. Why go to Minnesota?

Mr. [illegible]. He said it was a good pasture grass. Is that true?

Mr. Piper. In Oklahoma?

Mr. [illegible]. Yes. He said it would make an increased pasturage [illegible]. Would it?

Mr. Piper. We have no evidence to indicate that quackgrass would be a valuable grass in Oklahoma. That is rather far south for quackgrass. It is a northern grass, and it has made most trouble in the northern tier of States.

Mr. [illegible]. This fellow was a practical man. He is worth $500,000 and he thought that would be a good scheme.

Mr. Howard. Does quackgrass occur on the Pacific coast?

Mr. Piper. There has been quackgrass in the State of Washington for a good many years. Quackgrass is nothing new in the West. I saw it in Oregon twenty-odd years ago.

The Chairman. I suppose you now take up your projects. We shall have to be as brief as we can, Doctor.

Mr. Piper. Yes; I will try to be very brief. There is scarcely need for me to explain what is covered by forage-crop investigations. Raising forage for farm animals is an absolutely fundamental thing on farms everywhere. That is, any permanent system of farming almost inevitably means forage and live stock. Incidentally, I may state that in connection with the forage-crop investigations we have since the first of July of this fiscal year had added to this item the cactus investigations and the weed investigations, which were formerly carried on by the Office of Farm Management.

I will first take up the subject of forage-crop investigations. The first project is that of alfalfa. We have been studying very carefully the factors that pertain to the growing of alfalfa in the East. There has been an enormous interest in alfalfa in the East, which is increasing year by year rather than decreasing. In fact, there have been a good many public propaganda of one kind and another urging farmers to plant alfalfa. We think we know the factors necessary for the successful growing of alfalfa in the East pretty

oroughly now, and in general we are cautious about recommending farmers in the East the planting of alfalfa.

We recommend it for the dairy farmer and for the farmer who will ve it the special care it needs. On certain areas of land, as on nestone soils in Kentucky, Tennessee, New York, and other States, id on the black lands in Alabama and Mississippi there is very little fficulty in growing alfalfa, and on those particular areas of land we not hesitate to advise any farmer to plant alfalfa.

In the West we have been doing a lot of work in the Dakotas with ie idea of securing better hardy alfalfas. The best we have now is ie variety known as Grimm, which is a hybrid between the ordinary ellow-flowered and the common purple-flowered alfalfa of Europe. number of years ago the department introduced from Siberia umerous strains of yellow-flowered alfalfa different from those in urope and varying not a little among themselves. We believe, id our results thus far indicate that the cross between the best of ese Siberian yellow-flowered alfalfas and the best purple-flowered lfalfas will give us a hardy alfalfa better than we now possess.

The yellow-flowered alfalfas in themselves, we think will never ave more than a very limited value. They produce only one cut- ng. Their seed habits are very poor, so the seed will always be pensive, and most of the varieties are rather procumbent. There e, however, one or two varieties which are nearly erect. We do t feel that the yellow-flowered alfalfas in themselves will be of uch value in agriculture, but the hybrids from them, we think, will extremely valuable.

Mr. HELGESEN. How do you recommend the sowing of the seed— itself or with nurse crop?

Mr. PIPER. Of the ordinary yellow flowered?

Mr. HELGESEN. Of the Grimm.

Mr. PIPER. The general rule is this: That where alfalfa grows with- t any particular trouble you may use the nurse crop; but if you have y difficulty whatever in getting a stand leave the nurse crop out. ie nurse crop never helps you to get a stand. It is not a nurse crop, t rather a robber crop. The alfalfa grows in spite of the nurse crop. We have been working with many other varieties of alfalfa obtained m all parts of the world with the assistance of the Office of Foreign ed and Plant Introduction. One of these, Peruvian alfalfa, is very ll adapted to Arizona and California. It is the most valuable vari- y for that region and is the most rapid growing alfalfa we have cepting the Arabian. The Arabian, however, is a short-lived strain. e have recently found that hybrids of the Arabian and the ordinary alfa give us a variety indistinguishable from the Peruvian; and m what we know of the history of the Peruvian it probably origi- ted in this manner.

We have also been paying very considerable attention to seed pro- ction of alfalfa, because there is yet imported every year great quan- ies of alfalfa seed into this country.

Mr. HAWLEY. About how much in value?

Mr. PIPER. About 6,000,000 pounds a year.

Mr. HAWLEY. What would that be worth?

Mr. PIPER. Laid down in New York it would be worth about 14 nts a pound, would it not, Mr. Oakley?

Mr. OAKLEY. More than that now; about 16 or 18 cents a pound.

Mr. [illegible] I might say that we are making various technica[illegible] in the line of improving alfalfa seed production in this country [illegible] the importance of seed which is largely [illegible] seed and that variety is not desirable for this country, except [illegible] parts of that area.

Mr. [illegible] Have you [illegible] alfalfa?

Mr. [illegible]

Mr. [illegible] I wanted to inquire [illegible] the question of that Hansen seed, that Siberian alfalfa. What are you doing with that?

Mr. [illegible] What we are doing with this personally is to use the best of those Siberian alfalfas to cross with the best of the purple-flowered alfalfas to get a better hardy alfalfa than the Grimm.

Mr. STEELE. Hansen at the Brookings College, I understand, sent out a great many plants to different individuals over the State of South Dakota and brought quite a good deal of seed with him, which he sold at $5 a pound. What results are they getting from that seed, do you know?

Mr. PIPER. That work is being conducted by the South Dakota Experiment Station. I believe the State of South Dakota did buy some seed from Siberia. What results they are getting I can not say. The method has been recommended to plant it in hills or rows. I have no doubt from our own experiments that by that method in dry regions you can get a larger yield of alfalfa or grass than you can by broadcasting. That is, where the conditions are very dry. Of course, it is difficult to harvest hay under such conditions, as it gets very dusty. I think it will be some time before the farmers in the West will grow such crops in cultivated rows for hay.

Mr. STEELE. I thought it might be interesting to you and also to this committee to know that I have been investing in that Siberian alfalfa. Mr. Hansen gave me 50 plants three years ago and 48 of them grew. There was nothing else that grew in the whole country, it was so dry. From the weather report at Fort Sully and at Pierre, it was shown that that year was the driest year in 40 years, that we had less rainfall, yet those plants did grow about 18 or 20 inches high and had some seed. The next year he gave me 1,000 plants, and he came and visited the farm and I then bought 1 pound of the yellow alfalfa seed at $5, and I sowed that in a seed bed, and then a pound of the other, and he sent two men there to take up those plants and fix them to plant for the next spring, and he had it figured out that I had enough to plant 80 acres. He made a tool, a machine with which you could plant these plants. The thousand plants grew well, but this year we were only able to get 32 acres, because they did not bed all these plants, so we only got 32 acres on account of the wet weather. This is in the arid country, and it looks to me as though that is the best alfalfa for that arid country, and I think the department ought to get in touch with what Mr. Hansen is doing, because South Dakota does not contain all the dry, arid country, and I believe this alfalfa is going to make it possible for us to have a forage plant in that country.

Mr. PIPER. We are, of course, familiar with what Prof. Hansen has been doing ever since his first trip to Siberia under departmental auspices. I can not, however, see how, under present economic conditions, a western farmer can afford to grow alfalfa for hay in cultivated rows. In the future, when economic conditions are different

than they now are, I think it may be possible, but I am unable to figure out to my own satisfaction how that possibly could be recommended at the present time.

Mr. STEELE. Then you have ruined me, because I have figured the millions I was going to make out of this seed as a forage plant. I was going to plant about 500 acres of it.

Mr. PIPER. If you can get $5 a pound for that seed, you may make some money, and for some years to come you may be able to do that.

Mr. STEELE. I do not want to raise anything to sell to anybody that is not going to be profitable.

Mr. HELGESEN. If you want to produce alfalfa for seed only, would it not be well to plant in rows?

Mr. PIPER. That is an excellent method by which to produce seed alfalfa in dry regions. We have recommended that method because you can get very much larger crops of seed under conditions too dry to grow alfalfa broadcasted. The yellow-flowered alfalfas are extremely poor seed producers, and this seed will always be expensive, no matter how it is raised. That is a tremendous handicap. The hybrids with the purple-flowered alfalfas are almost as hardy and they have good seed habits. These hybrids are going to be extremely valuable crops for the cold States, unquestionably.

Mr. STEELE. This Siberian alfalfa grew, and the others, the Turkestan or your native alfalfa here, dried out on account of the drought; so I feel it is going to be a good thing at that.

Mr. PIPER. I hope so.

In regard to red clover investigations, we feel that these are extremely important. Of course, red clover is almost the corner stone of agriculture in the North. The figures of the censuses of 1899 and 1909 disclose some very remarkable facts. During that decade in New England the decrease of acreage of red clover was 19 per cent, in New York 15 per cent, in Pennsylvania 78 per cent, in Ohio 71 per cent, Indiana 65 per cent, Michigan 25 per cent, Iowa 16 per cent, Minnesota 23 per cent, and Missouri 30 per cent. Of course, it has been a notorious fact for years that there has been increasing difficulty in getting stands of red clover.

Mr. HELGESEN. Is that on account of disease?

Mr. PIPER. The causes of the trouble are very obscure. There are various theories, a dozen, perhaps. There may be truth in all of them, but the exact cause or combination of causes is still a question. It is known, however, that under most circumstances good stands of red clover can be obtained either by the use of lime or by the abundant use of barnyard manure. Just why it is that two different substances give the same result is also purely a matter of theoretical speculation at present. But this enormous decrease in acreage is a matter of such vital importance that we are conducting critical investigations to ascertain the real causes. In the meantime, we urge farmers to adopt means, either the use of lime or the use of abundant barnyard manure, to continue to grow red clover.

Mr. ANDERSON. Does what you have just said apply only to red clover?

Mr. PIPER. It applies only to red clover.

Mr. REILLY. Is it not a fact that the red-clover plant is killed out by frost in the wintertime?

Mr. PIPER. That sometimes happens, of course, in the North.

Mr. [illegible] in Wisconsin where we had a good spread of snow on the ground we had good stands of red clover, and we have no other way of accounting for that except in the wintertime and that the snow kept freezing up that away from.

Mr. PIPER. I have not the Wisconsin census figures here, but there has been a decrease in acreage in Wisconsin.

Mr. [illegible]. Certain of them, because the weather conditions have changed and it is being killed in the winter.

Mr. PIPER. That the weather conditions have changed over the entire country. I may add that apparently this same history of trouble with red clover has been experienced in Europe and there has been a great deal of investigation over there. It is not sure that our troubles which are usually lumped under the name of "clover sickness" are quite the same as those in Europe. They have at least two diseases in Europe that are not known in this country and which are considered by some investigators to be important factors in the problem in Europe; but inasmuch as this same difficulty has occurred in Europe and in this country, it hardly looks as if the weather could be the whole explanation.

Mr. HELGESEN. I do not suppose any of the States have more frost than we have, and we have found that where the land is properly inoculated or where they use manure, the clover will stand the winter; but if you sow your seed on land which has not either been artificially inoculated or upon which not enough manure has been put, you will have a fine stand the first summer, but it will winter kill. Whether there is anything outside of the inoculation I do not know.

Mr. PIPER. This clover sickness has been gradually extending westward. Only in recent years have they had any trouble in Iowa, and some of the far western States have had no trouble at all yet. That looks rather like a disease or a combination of diseases traveling westward.

Mr. MCLAUGHLIN. Do you find inoculation necessary for red clover?

Mr. PIPER. It is absolutely necessary. That is, there must be nodules in order to grow the crop- not necessarily artificial inoculation. Artificial inoculation is seldom necessary now because the nodule germs are spread all through the clover belt.

Mr. HELGESEN. It is different, though, with alfalfa inoculation. That has to be added generally, does it not?

Mr. PIPER. When you plant it for the first time; yes.

Mr. HELGESEN. Is it not your experience that manure will take the place of artificial inoculation with alfalfa as well as with clover?

Mr. PIPER. Manure is usually helpful in securing inoculation, but does not in itself insure inoculation.

Mr. HOWELL. You do not contend that alfalfa seed has to be inoculated in the West?

Mr. PIPER. It does not at all.

Mr. HOWELL. Just for the eastern sections?

Mr. PIPER. In many places where it has not grown and on land which is new to alfalfa inoculation is usually necessary.

Another method of meeting this red-clover difficulty has been the use of substitutes. Alsike clover has been in use by farmers and it is very common to plant the alsike and the red clover together. Under certain conditions sweet clover is used where alsike and red clover

lo not do. Hairy vetch in some States is being used as a substitute lso.

Mr. HELGESEN. Sweet clover is being exploited in our State just ıow, and we are interested in knowing its value. They tell us that f you sow a crop of sweet clover it inoculates the soil for alfalfa. Is hat a fact?

Mr. PIPER. Our own experiments show that it is quite as difficult o secure inoculation of sweet clover as it is of alfalfa. We conlucted accurate experiments on that point some years ago and found here was no basis for that idea.

Mr. HELGESEN. But the seedsmen of the Northwest are adverising that all over the country?

Mr. PIPER. That is a commercial matter.

Mr. HELGESEN. I want to know the facts. It is the most droughtesisting plant that I ever saw.

Mr. PIPER. It is more drought-resistant than alfalfa.

Mr. HELGESEN. In the northern section of our State I knew a case vhere there had been a crop of sweet clover inside of a fence. The oad was the original prairie, just the old trail, and out in that 4-rod oadway, that never had been plowed and which was hard and dry, here was produced a crop of sweet clover growing 3 to 4 feet high ight in the prairie sod. It looks to me that it must be a pretty lrought-resistant plant to produce such a crop under such conditions.

Mr. PIPER. That also points out another thing. A very firm seed bed is usually necessary for sweet clover. It delights in a very firm soil.

Mr. HOWELL. Do you regard sweet clover as a good crop to raise in alkali soil?

Mr. PIPER. Sweet clover will stand more alkali than alfalfa and more than most legumes.

Mr. HAWLEY. Is there enough red-clover seed raised in this country to supply the needs of the country?

Mr. PIPER. We have ordinarily exported red-clover seed. In the ast few years there has been a shortage of red-clover seed. That is lue to the difficulty there has been of growing sufficient in this country with this increasing difficulty of securing stands of red clover.

Mr. LESHER. Have you stated as to how sweet clover compares vith other clovers as to feed value?

Mr. PIPER. Very favorably. In general, we would not recommend to a farmer to grow sweet clover where he can grow either red clover or alfalfa advantageously. Where sweet clover grows better han red clover or alfalfa, he had better use sweet clover, and a lot of farmers are doing that.

Mr. MCLAUGHLIN. Alfalfa exceeds the ordinary red clover in feeding value, does it not?

Mr. PIPER. Slightly.

Mr. MCLAUGHLIN. Is not sweet clover equal to alfalfa in feeding alue?

Mr. PIPER. Probably not. We have not a very large amount of ata on the feeding value of sweet clover. As hog pasture, very xcellent results have been obtained. One thing which recommends s use for pasture is its bitterness, so that it is rare for animals to loat on sweet clover as they do on alfalfa.

Mr. McLAUGHLIN. It has been said to contain even a larger feeding value than alfalfa.

Mr. PIPER. I think that very doubtful. Of course, you must understand that a good many people, in speaking of feed value, have based their opinion entirely on the chemical analysis. We do not know certainly how to interpret a chemical analysis in terms of feeding value. The real feeding value can only be determined by very careful feeding experiments, and they are expensive. There is still an insufficient number of them regarding many forage plants to be conclusive. Especially is this true of comparative feeding tests—for example, comparing hairy vetch with alfalfa, alfalfa with sweet clover, etc.

Mr. McLAUGHLIN. Then evidently one can get about the same results from sweet clover, alfalfa, or hairy vetch, and you would advise the farmer to grow the one he can grow the best?

Mr. PIPER. Exactly. Generally speaking, all the forage legumes are of approximately equal feeding value. That is what the results of actual feeding tests show.

Mr. McLAUGHLIN. I thought all three I spoke of exceeded the red clover?

Mr. PIPER. That statement was probably made on the protein content which a good many people interpret as being equivalent to the feeding value, but that is known to be erroneous or not necessarily to follow.

Mr. McLAUGHLIN. Then, about the only advantage of alfalfa over sweet clover is the quantity which can be raised and the practically permanent crop?

Mr. PIPER. And its extreme palatability, because animals will eat such large quantities.

Mr. STEELE. Mr. Coverdale, of Iowa, was the principal leader in this sweet-clover proposition?

Mr. PIPER. He is a great enthusiast. He has done a great deal to further its culture in that State and elsewhere.

Mr. STEELE. He came pretty nearly ruining me, too. I sowed 42 acres, and then after getting in touch with him I sowed 100 acres on my ranch. When I came to make hay out of it, I found I would have to cut it and wait three or four weeks to put it up. It was so full of moisture I could not get it to cure. Then when I pastured it, it seemed to be so loosening on the animals that they did not do well.

The CHAIRMAN. The mistake the gentleman from Iowa made was in not coming to Congress sooner so as to learn these facts.

Mr. STEELE. You fellows will ruin me yet.

Mr. PIPER. Our consistent policy with a new forage crop has always been to advise a farmer at the start to plant only an acre, then to feel his way along, depending on the results he gets from that acre I think any farmer is foolish to take a new crop and start in by planting a large acreage

Mr. HELGESEN. Have you had any success sowing sweet clover in the spring?

Mr. PIPER. Early spring sowing is very good on a firm seed bed That is the natural way of reseeding this plant, by the way.

Mr. HELGESEN. Shortly after the frost is out?

Mr. PIPER. The seeds fall on the ground in the fall, lie upon or near the surface of the ground in the winter, and germinate in the early spring.

The CHAIRMAN. This is very interesting, but we will have to push along. Take up the next line.

Mr. PIPER. Some of these projects I think I may pass over. In regard to sorghum there is nothing of particular moment. So also with the project of dry-land forage crops other than sorghum. The timothy work is being conducted mostly at Elyria, Ohio, in cooperation with the Ohio Experiment Station. We have developed a number of what we regard as much improved strains of timothy, and some of these will be distributed next year in the new and rare seed distribution.

Mr. ANDERSON. In what respect is it improved?

Mr. PIPER. Larger growing and higher yielding under Ohio conditions. The first distribution will be in a comparatively circumscribed territory, where we feel sure it will maintain its superiority. I wish to say a few words in regard to pasture investigations, in which both in the department and at the State experiment stations comparatively little work has been done as yet. I had a letter on this subject from the Cornell Experiment Station a few days since. This is, perhaps, the richest experiment station in the country, and wants the department's assistance. They point out that in the State of New York there are three and one-half million acres of crops cut in hay, 5,000,000 acres of land in hay, and 11,000,000 acres of land in pasture, pasture being the largest agricultural resource in New York and really the basis of their great dairy industry. Now, what has been learned about pasturing in the past has been mainly from plat trials and from observations. The actual ascertaining of the value of pasturage as measured in milk or meat production involves very expensive experiments. We have been conducting such experiments on bluegrass with the Virginia Experiment Station, and we hope to arrange similar experiments elsewhere. The Virginia experiments have been carried on now over a period of five years, and one of the most striking results that has come out of it is that you get most out of your pasture by very heavy alternate pasturing. In other words, have two pastures, graze to the ground in one, then put your live stock in the other, and so on. By the ordinary method of pasturing a great deal of the pasturage is wasted; that is, the animals do not eat it.

I mention this mainly to call your attention to the enormous importance of this subject and the fact that, while pastures are a very great thing in agriculture, our knowledge concerning them is very limited.

Sudan grass. So far as the investigations are concerned, Sudan grass is pretty nearly a closed chapter. I may state, however, that later we discovered Sudan grass we also found five or six closely related plants, nearly every one of which was entirely new. We are doing a lot of breeding work with these and we confidently expect to have some very greatly improved Sudan grasses. In fact I think there is no doubt but within a few years we will have five or six very valuable varieties of Sudan grass, quite different from the original type.

The CHAIRMAN. So that Sudan grass is a foreign importation?

Mr. PIPER. It is a foreign importation. I got the first seed of it from Sudan. The existence of the plant was overlooked because everyone who has ever written on the agriculture of Egypt had considered it was the same as Johnson grass.

The CHAIRMAN. How closely are they related?

Mr. PIPER. They are pretty closely related but entirely different species. Johnson grass has rootstocks which makes it troublesome to eradicate, while Sudan grass does not have these at all.

The CHAIRMAN. A great many people regard Johnson grass as a pest. My father used to raise it and he thought it was the best grass he had on the place except Bermuda.

Mr. PIPER. I think your father was right. Of course, it is a pest where you do not want it, but the farmers who have been utilizing Johnson grass have found it a very profitable crop. With the increased interest in live stock in the South, I think Johnson grass will become more and more appreciated.

Mr. CANDLER. They made a test at the Mississippi Agricultural College with Johnson grass.

Mr. PIPER. Yes. At that place they do not have much grass but Johnson grass.

Mr. CANDLER. They made a test, and it is quoted, as a result, on the National Hay Exchange now.

Mr. LEE. I know of a farmer in Georgia whose farm was practically taken by Johnson grass, and he was much disturbed. Finally he decided just to sow it in Johnson grass and have a Johnson-grass farm. He has gotten rich selling hay.

Mr. PIPER. I have known a number of farmers to get rich in that way.

In connection with the Sudan-grass investigations, I had to investigate all the grasses closely related. That resulted in turning up three entirely different varieties of Johnson grass. One of these, from India, is much more thrifty and grows taller than Johnson grass but has twice as many underground rootstocks. We are experimenting with this very cautiously at the Mississippi Experiment Station, where they are not afraid of Johnson grass. I think that it is going to be a very much better forage grass than the Johnson grass. It may also turn out to be much more troublesome as a weed. We do not know about that. But I am exercising caution, because the department has been accused of introducing Johnson grass, which is not the case.

Mr. REILLY. You said a little while ago that Johnson grass in the South was the same as quackgrass in the North?

Mr. PIPER. As to difficulty of eradication, it is about the same.

Mr. REILLY. Is quackgrass as valuable for forage purposes as Johnson grass?

Mr. PIPER. Approximately. It does not produce the yield, though. You can ordinarily get three cuttings of Johnson grass on good bottom land. From quackgrass you can only get one cutting.

Mr. HOWELL. Who introduced June grass over the western country?

Mr. PIPER. June grass is another name for Kentucky blue grass. That was introduced with almost the first immigrants from England. It got into Virginia at a very early day, almost immediately with the first settlers.

[r. HOWELL. Is that the June grass that covers the mountains hills in the West that is so inflammable in July and August?
[r. PIPER. Those are native June grasses; they are related to ıtucky blue grass, but are native to the Rocky Mountains.
r. HOWELL. It has appeared possibly within the last decade.
r. PIPER. I am not sure as to the grass to which you refer. It be the ordinary blue grass, which is now pretty generally spread he West.
r. HELGESEN. In my country the roots of quackgrass get so laced, so thick, that the plant grows only about a foot high would be no good for hay.
r. PIPER. Exactly, but if you plow that up your next crop will he ordinary 3-foot high quackgrass.
r. HELGESEN. It would if you could kill a good deal of it first.
r. PIPER. I mean if you disk it up or plow it up. The same thing ɔens with Johnson grass. If you cut Johnson grass one year and ot plow that land, the next year you do not get anything worth e. The practice with Johnson grass is to cut the hay two or e times in the season, then plow it under, plant oats, and after the are harvested you get your stand of Johnson grass.
ıe CHAIRMAN. And if you want to eradicate it you pasture it ıt three years?
r. PIPER. And then plow it very shallow.
ıe CHAIRMAN. You may now take up your Rhodes grass.
r. PIPER. That is pretty nearly a closed chapter. Rhodes grass very valuable grass in Florida on rich lands, and its culture is nding pretty rapidly. Right here I want to refer to Natal grass lorida which has been exploited for the last three years by real te men. That was introduced by the department just 40 years and we have been doing more or less work with it during the past ears, recommending it in a quiet way. The farmers, or rather the estate men, finally realized its value and they have been exploiting ı central Florida particularly. Several very large real estate oitations in Florida are now being based on the Natal grass alone. he sandy lands in Florida they can count on getting three cuttings, ı of hay each, and they figure that Florida in a few years more quit importing hay into the State, which imports now amount to ly $3,000,000 a year.
ıe CHAIRMAN. Now take up cowpeas.
r. REILLY. Up in Wisconsin the farmers are trying to eliminate kgrass by summer fallowing and harrowing it. Will that system : successfully?
r. PIPER. The recommendation is in our bulletin, which is very . May I read this?
r. REILLY. Yes, sir.
r. PIPER (reading):

process of killing quackgrass on sod or pasture lands, beginning in midsummer, ery simple one. The first step is to plow the sod, cutting just under the turf, is usually about 3 inches deep. To thoroughly turn over a stiff quackgrass sod llow as 3 inches, it is advisable to use a special type of plow (Scotch bottom), ɜ a very long, gradually sloping moldboard. It has been found that with this f plow the sod can be turned very shallow. The next step is to go in a week or s later with a disk harrow and thoroughly disk the sod. Repeat this treatment 10 days or 2 weeks until fall, when the quackgrass will be completely killed out.

Mr. REILLY. Which do you think is the best method for exterminating the quackgrass?

Mr. PIPER. Where you have reasonably dry summers, use the summer harrowing method.

I will pass over the cowpea project, with your permission.

I want to talk a little about soy beans. Soy beans have been cultivated in this country mainly as a forage crop, and in the course of our work with that crop we have tested out about 700 varieties, mostly from China and Manchuria. Many of these are now in cultivation, and have pretty largely revolutionized soy-bean culture in this country. For several years past we have been interested in the matter of soy-bean oil, and have urged the mills of this country to go into the production of soy-bean oil. The importation of this oil into the United States in 1915 amounted to over $9,000,000 worth. That was mainly from Manchuria. The importations into Europe have been very much heavier. This year, for the first time, we got one of the mills in the South to go into soy-bean oil production. They find they can make a very handsome profit out of it, paying the farmers $1 a bushel for the seed. The farmers are willing to grow any amount of soy beans for that price.

I think this industry is going to be an extremely important one in the South. The other oil mills are getting very much interested, and I would expect it to become a very important crop all through the cotton belt and northward to middle Iowa and middle Illinois

Mr. HAWLEY. What is that oil used for?

Mr. PIPER. For various purposes. About 30 per cent of it can be mixed with linseed oil for paints. The paint people have been much interested.

Mr. HELGESEN. It can be mixed with paints, but what is the result?

Mr. PIPER. All I know is the result of researches made by Mr. Gardner, who was employed by the American Paint Manufacturers' Association a few years ago when linseed oil was very high. He found that up to 30 per cent of soy-bean oil could be added to linseed oil for paint manufacture.

Mr. HELGESEN. That is because it was profitable to them, I think. Mr. Rockefeller spent half a million dollars trying to find a substitute of any kind for linseed oil and has not been able to find it.

Mr. PIPER. This is not a substitute for linseed oil.

Mr. HELGESEN. It certainly is not linseed oil.

Mr. PIPER. Certainly not; but 30 per cent of this oil can be added to linseed oil and still have satisfactory oil for paint purposes. At least, that was Mr. Gardner's conclusion.

Mr. HELGESEN. You do not think it would be as satisfactory as linseed oil, do you?

Mr. PIPER. Probably not. It would not be an equally good drying oil, certainly.

Mr. HELGESEN. The wearing qualities are the main thing, and I think you should be extremely careful in recommending the use of any mixture with linseed oil, because ninety-nine out of a hundred are not going to be satisfied with what is recommended.

Mr. PIPER. We have nothing to do with recommending this oil. I am merely stating what the paint people found out through their own investigators and what has been told us in the case.

HELGESEN. They do make paints now and sell them to the s that have not got a speck of linseed oil in them and claim ıey are as good as the others, but it does not work out; and, rou have made no recommendations, they will find this in the here and will use it without a doubt.
PIPER. There was imported into this country 20,000,000 ı in 1915, at a valuation of $9,000,000.
HELGESEN. I understand.
PIPER. And I understand very much more of this oil is being r soap manufacture. It is also used for human food. There is deal of investigation under way now on modifications of soy- d. The cake is used largely for feeding and a good deal is used)pe now for human food. I believe a great deal will be used in ıntry for that purpose. Of all the leguminous seeds, soy beans raised the most abundantly and the most cheaply.
McLAUGHLIN. And the farthest north?
PIPER. They can be raised clear up into Ontario—up to our :n boundary—but the great soy-bean section will be from Ohio and middle Illinois southward. Still we have gotten ıtisfactory crops in New York and even in southern Minnesota.
HAWLEY. Down on the Pacific slope also?
PIPER. No, sir. The weather is too cool there—that is, the are too cool. Soy beans want hot weather.
McLAUGHLIN. What do you think of the way some have of ; corn and soy beans together, letting them grow together tting them for silos?
PIPER. That is very good practice and is done a great deal.
McLAUGHLIN. How much does it add to the food value of the

PIPER. Soy-bean hay, from actual experiments, has almost tfh eeding value for milk and butter production as does lfaalue

McLAUGHLIN. And the beans themselves—they produce some ent? All that goes in, too, does it not?
PIPER. That is all a part of the hay. It is mostly cut for hay he seeds are half-grown.
HELGESEN. Would it be advisable to grow that for silage so rth that it would not mature seed?
PIPER. I have never seen it grow for silage north of the lati- southern Indiana.
REILLY. Where they grow the soy bean for seed, they do not or feed, do they?
PIPER. Eastern North Carolina is probably the region where st soy beans are grown at the present time. I mean more are in that region than in any other equal area. The straw after ins have been thrashed out has sold for $6 to $10 a ton for rposes.
McLAUGHLIN. If the soy bean is of no more value than alfalfa it advisable to put it in a silo with corn, if one has plenty of ır alfalfa hay besides?
PIPER. Not at all.
McLAUGHLIN. What is the effect of putting it in the silo?
PIPER. Where it is mixed with corn you get a very good silage. put it in alone you are apt to get a very ill-smelling silage.

Mr. McLAUGHLIN. How would it compare with the alfalfa that was not put in the silo?

Mr. PIPER. You mean alfalfa as a silage?

Mr. McLAUGHLIN. No. Suppose these soy beans were put into the silo with corn. You say the feeding value is about the same as alfalfa when it is cured as hay. What is the action of the silo on it? Is it as good as alfalfa?

Mr. PIPER. You mean as good as alfalfa for hay?

Mr. McLAUGHLIN. Yes; I do not mean alfalfa put into the silo.

Mr. PIPER. The feeding value of anything is presumably not increased or decreased by putting it in the silo. The palatability is sometimes increased. Of course, in this question you are comparing green soy beans put with corn into silage and alfalfa hay. That is a very difficult comparison to make.

Mr. HELGESEN. If one lets those beans grow with the corn until the proper time to cut both for silage, they are not very green are they? Are not the beans pretty well matured?

Mr. PIPER. They are pretty well along toward maturity, but they are put in without curing, of course. Now, that is done at the present time largely on a theoretical basis. We know that all these legumes have high protein value, and by mixing them with the corn in the silo we get silage with higher protein value. That is the object of mixing the legumes with the corn.

The CHAIRMAN. All right. Now, Professor, take up the velvet-bean project.

Mr. PIPER. Velvet beans may be passed over very briefly. I may say that some eight years ago I got a certain kind of velvet bean in addition to the old Florida velvet bean, and by some industrious exploring finally got together about 20 kinds. Two or three of these are much earlier and have resulted in extending the velvet-bean area much farther north than it formerly was. They can be grown very satisfactorily now in Tennessee and North Carolina.

The CHAIRMAN. All right; take up, now, the subject of vetch.

Mr. LEE. Is it safe to turn cattle and hogs on the velvet-bean field when they are practically ripe?

Mr. PIPER. Yes, sir; that is, it is the better practice to turn them in after the first frost when their growth is completed.

Mr. LEE. Can you leave the animals there for a number of days at a time, or do you have to take them out for a few days?

Mr. PIPER. I have never heard of any ill effects.

Mr. LEE. I thought they would founder them. They are very rich, are they not?

Mr. PIPER. I have never heard of foundering from velvet beans. After frosting, the leaves dry very rapidly and the animals eat the pods as well as the dried leaves. I have never heard of any ill effects following.

Vetches I can pass over very briefly. The most interesting development has been the introduction of the purple vetch, which produces more seed than any other and in California has proven to be rather more satisfactory than any other vetch for use as a green manure. Inasmuch as the California people use enormous quantities of that seed, it has been a matter of considerable importance to vetch-seed growing sections, particularly the Willamette Valley of Oregon.

The CHAIRMAN. Your next item is range investigations.

Mr. PIPER. Range investigations were turned over to the Office of Forage-Crop Investigations at the beginning of the present fiscal year. The prospect is that the work will be rather radically reorganized, because the main work that has been under investigation has been turned over to the Forest Service in connection with their range work. The range work which we shall continue will be an intensive study of pastures on dry-land farms. You heard yesterday that practically every western man now believes—that dry-land farming must be put on a live-stock basis, and in connection with that dry-land pastures are going to be of increasing importance. Already we have had many calls for assistance to try to increase the carrying capacity of these dry-land pastures. What we expect to do along that line is to try to find better dry-land pasture plants. These will have to come in the main from central Asia. I may say, very briefly, that nearly all the pasturage of the developed parts of the country is made up of introduced plants. In the South, Bermuda grass and Japan clover; in the North, Kentucky bluegrass, redtop, and white clover in California, many kinds of Mediterranean plants, like bur clover; filaree, wild oats, etc. These plants are now spreading over the Columbia Basin region from California. It stands to reason that by getting grasses and legumes from places which are similar to our dry regions we will find some which will spread over our dry lands and add to their forage. That is one of the principal lines of work which we shall follow up. The problem as I look upon it is quite radically different from the mountain ranges where the native herbage can be pretty readily maintained. On the lowlands these introduced plants may drive out the native plants, as they have in California, but, except for sentimental reasons, I see no reason to favor the native plants.

The CHAIRMAN. Please take up now your cactus investigations.

Mr. PIPER. Cactus investigations are largely devoted to the forage possibilities of the crop. Our own results lead us to have a rather moderate opinion of the future value of the cacts in agriculture. We have shown that spineless cactus, and the spiny ones also for that matter, can be profitably grown in dairy farming in regions adapted to these plants. They help to solve the question of a reserve food supply in seasons of shortage, providing a sort of "living silo," as it has been termed.

Mr. HELGESEN. Have they been put in silage?

Mr. PIPER. That has never been tried. They have too much water content, and it would be needless to put them in silage.

Mr. HAWLEY. Do you think the spineless cactus will continue to be spineless when grown for several years?

Mr. PIPER. Essentially so; not absolutely so.

Mr. HAWLEY. Will they get enough spines on them to make them dangerous?

Mr. PIPER. No. Of course, spineless cacti have been grown for many hundreds of years and they retain their essential spineless character.

We have been following this up pretty carefully because there have been a lot of very wild exploitation schemes based on spineless cacti. I was told by a railroad man, a Southern Pacific shipping agent, that they sent between 30 and 40 carloads of spineless-cactus cuttings

[illegible] of [illegible] the past to be planted in the Gulf States. [illegible] of [illegible] is quite true in these States there is no [illegible] of the cactus as being a valuable forage crop. It can [illegible] with other forage plants adapted to that region. [illegible] is all supposed to be based on Burbank's [illegible] as a matter of fact five or six kinds of spineless [illegible]

[illegible] with these cactus investigations. There are a number of [illegible] of a forage nature that are being developed, [illegible] the possibilities of their ornamental value and their usefulness for [illegible] production. The cactus work is kept as a single unit at the present time. In connection with the study of these plants, it has been necessary to undertake some rather extensive studies into the identity of the different species. There are a very large number of these flat-jointed cacti, and the differences which distinguish them are very slight; so it takes very thorough study to tell each particular cactus you may be dealing with.

The CHAIRMAN. Right here you have the weed and tillage investigations.

Mr. PIPER. I do not know but that the weed business has been pretty well touched on already.

The CHAIRMAN. Yes; I think so.

Mr. PIPER. I may say briefly, however, that these studies are of two distinct sorts—one, the intensive study of particular weeds, like quackgrass, Canada thistle, wild onions, etc.; the other a sort of survey type of study which was commenced in the Office of Farm Management—the endeavor being made to ascertain just what the relation of different systems of intertillage is to the amount of weed growth and to the yields secured. These data are exceedingly interesting and suggestive, but they are not as clear as they might be in the conclusions which one can draw definitely from them.

Mr. HELGESEN. Have you experimented with spraying with the various kinds of sprays to cure and kill weeds?

Mr. PIPER. We have done a great deal of work of that kind and are still continuing it. Certain of the chemical weed destroyers are very excellent for use along railways and roads for destroying weeds, but the largest use for chemical sprays at the present time is in the wheat regions for the destruction of mustard, where they have been very satisfactory and successful.

Mr. HELGESEN. Will not those sprays kill all broad-leafed plants?

Mr. PIPER. They will kill practically all broad-leafed annual plants.

Mr. HELGESEN. What can you do about the sow thistle and the kinghead and those things, and what remedy have you got for them, if any?

Mr. PIPER. The sow thistle ordinarily has not been very troublesome. The kinghead is a native plant and is troublesome because the seed gets in the wheat.

Mr. HELGESEN. I do not agree with you. The sow thistle is going to ruin those farmers up in our country unless some remedy is found for it. Let me tell you something. The wheat section of this country is of sufficient importance to deserve a great deal of attention, because I do not think it is exaggerating at all to say that the yield of spring wheat has been reduced one-third on account of weeds

s, they could raise 30 per cent more if they did not have all
weeds to contend with to-day. Many farms have become so
at you can not farm them profitably, and the proposition carries
a loss from $35,000,000 to $75,000,000 a year. So it looks to
if it were worthy of considerable study on the part of this
ment.

PIPER. That statement that you make I think is characteristic
regions where wheat growing has been the main type of agri-
. In California the weed proposition finally became so bad
wheat growing has largely ceased—that is, straight wheat
g in the Sacramento Valley. In eastern Washington and
Oregon the weed problem is getting much more difficult.
argely controlled there by the method of summer fallowing.
rse, the best general method of controlling weeds is by alter-
a broadcasted or drilled crop like wheat with an intertilled
ke corn or potatoes. In other words, the simplest method to
weeds is the right kind of a rotation.

HELGESEN. That is true where you have a section of the
y where you can do it, but in our country you could not raise
es enough because there is no market for them, and you can
se corn successfully enough to use that. Now, there is a very
rea, the largest part of the spring wheat section of the country,
that is true. Unless you can find some remedy for these very
ctive weeds which are so hard to kill, I do not know what is to
e of the Northwest.

PIPER. The subject is certainly worthy of very serious investi-
, but, offhand, I would say that where you can not have inter-
rops to grow in rotation, you will have to resort to the second
f weed killing, namely, summer fallowing.

HELGESEN. But summer fallowing will not kill them.

PIPER. What are some of these weeds it will not kill?

HELGESEN. It will not kill sow thistles; it will not kill king-
it will not kill the Canada thistle.

PIPER. You are quite right; that it would not kill the Canada

HELGESEN. That is only a portion of the list. I could not
them all, but we have got a lot of them that summer fallowing
ot kill. For many of these weeds they have plowed several
in a season and then continual cultivation between plowings,
s difficult to kill them, and it looks to me as if this proposition
overshadowing the entire subject in its importance—certainly
times so as regards the money loss every year—that you ought
nore toward helping out on this proposition.

PIPER. It certainly is an extremely important problem.

HAUGEN. What suggestion have you as to how to destroy
grass?

REILLY. That is in the record. He spoke of that before you
n.

HAWLEY. I should like to ask you about the Canada thistle.
ame so great a detriment in our State that the legislature at
st session authorized the county attorney, or the counties
h their county attorneys, to exterminate it on every farm at the
e of the farmers if they do not do it themselves. What
ds of eradication for the Canada thistle do you suggest?

Mr. PIPER. The best method of destroying the Canada thistle is to go after it immediately and persistently. It is largely spread by tillage operations. In most parts of the country it does not make good seed but the plow and the harrow etc. carry pieces of the underground roots and every piece a half inch or so long will grow into a new plant. The only successful method that I ever found was to keep right after it all through the growing season, harrowing it or otherwise treating it so that its green leaves are formed.

Mr. [illegible] suppose it is in a pasture?

Mr. PIPER. You have to do the same thing in pastures.

Mr. [illegible] dig them out?

Mr. PIPER. There is no way to kill it by the use of chemicals, because most chemicals which are put down will not reach many

Mr. [illegible] if it is cut down it will still propagate?

Mr. PIPER. If you will keep it cut down so that it does not form any green leaves at all through the season you will starve it to death.

Mr. [illegible] in one season, Professor?

Mr. PIPER. Usually in one season, especially if that is followed with a crop which you will usually get rid of it entirely.

Mr. [illegible] some person has stated that you can smother out Canada thistle with alfalfa. Have you been successful in that?

Mr. PIPER. Only after the plants have been weakened by a season of treatment, just as I have suggested.

Mr. HELGESEN. Let me have just a little comparison. Here you have got a item of $600 for the extermination of weeds. It is not given in the report what section it takes in. Does it take in the whole United States?

Mr. PIPER. Yes, sir.

Mr. HELGESEN. Yet, so far as you know, as you have yourself stated, or so far as the department knows, they can not kill it, and the only remedy you have got is cultural methods and how to farm so as to avoid being ruined by them. You are expending $600,000 and have been doing so for years in the South on the cotton situation mainly. Either you are spending too much in the South or too little in the North. I think I know perfectly well what is being done. I know you are spending too little in the North. I have nothing against any work in any part of the country; but if you want to spend $600,000 on the culture of cotton and on the boll weevil, it is about time you were spending something on something else.

The CHAIRMAN. How long has this appropriation stood at that figure, do you know?

Mr. PIPER. Several years. This work was conducted in the Office of Farm Management up to the present fiscal year, and on the 1st of July it was turned over to the Office of Forage-Crop Investigations.

Mr. MCLAUGHLIN. How much money would it take to make a thorough investigation of that weed proposition in the wheat section of the country of which Mr. Helgesen speaks?

Mr. PIPER. That would be difficult to say until the situation had been first surveyed.

Mr. MCLAUGHLIN. How much would it cost to make a satisfactory survey?

Mr. PIPER. That would take at least the services of one man for a year.

Mr. HELGESEN. One man?

Mr. PIPER. To make a survey of the situation.

Mr. HELGESEN. He would be a dandy if he makes it alone in one season.

Mr. PIPER. You have rather uniform conditions in North Dakota.

Mr. HELGESEN. This is not only in North Dakota. It is in Minnesota, South Dakota, Montana, and in the whole spring-wheat section.

Mr. PIPER. One man could not do it for that entire region. I had only North Dakota in mind.

The CHAIRMAN. He could only make a very general survey.

Mr. HELGESEN. It is an extremely serious problem when you consider that it reduces the yield of spring wheat one-third; and not only that, but it likewise reduces the yield of barley, rye, etc. I think they have all been reduced fully one-third.

Mr. PIPER. Of course, it must be borne in mind that the weed problem is a perennial problem everywhere in the United States. Countries where there is no weed problem are countries where agriculture is extremely intensive, as in Japan, where as fast as a weed comes up there is a man in the field to pull it out. But where an extensive agriculture is conducted, as in this country, we are confronted with weed problems in every section of the country.

Mr. HELGESEN. That is true; but in your cotton proposition there has been spent $600,000 a year for the last 10 or 20 years, and I understand all you are doing is to tell them how to farm so as to get the best results on their farms. You are not attempting to kill off the boll weevil, because you say it can not be done. Now, I think a little attention given to this wheat section of the country, which produces this vast quantity of grain, would greatly benefit this country and a good deal of the world besides; and I think it is a very conservative statement to say that the yield could be increased 50 per cent if it were not for the destructive effects of these weeds.

Mr. MCLAUGHLIN. What would the survey you mention consist of?

Mr. PIPER. When I answered your question, I was speaking merely of the State of North Dakota. I think one man traveling through North Dakota could get a very closely approximate idea of the weed problem of that State—of the weeds that are most destructive, of those which are being fairly well handled, and those which are not being fairly well handled, by the present methods of agriculture.

Mr. HELGESEN. He would make a survey to find out the general result of these weeds, what effect they have on the crop, and to what extent that is. We know absolutely what the damage is that is being done. We do not, however, know how to conteract the trouble. Besides having a man for the general survey, would you not go out and take those weeds and try by experiment to find out if there was not some way of killing them?

Mr. PIPER. Exactly. First, I should want to know what the problems are; which one of these weeds the farmers have been able to control fairly well, and which ones they have not been able to control under their methods of agriculture. I do not regard it as wise to establish even a temporary station for conducting experiments unless the problem is clear-cut and definite.

Mr. HELGESEN. It is clear-cut and definite to the extent that we know that it is reducing crops all over that country.

Mr. PIPER. I am not disputing that statement a particle. What I want to know is [illegible] myself or by one of my men, just what these weeds are, how well the farmers are able to control them by the methods [illegible] and which ones of them they are not able to control [illegible] When we know what the problem is, then we can determine the best method of procedure.

Mr. HEIDGESEN. You could make a survey to find out the kinds of weed they can not control. I can give you that very quickly.

Mr. PIPER. If you have all that information, it would save the expense of a survey of course.

Mr. MCLAUGHLIN. It might be that a man traveling over that country would find some farmer who is dealing with this question satisfactorily; then it would be up to the men making the investigation to learn the method pursued by that man.

Mr. HEIDGESEN. That farmer has not been found up there yet. He would be a great curiosity if you find him.

Mr. MCLAUGHLIN. Are not some doing better than others?

Mr. HEIDGESEN. Very little.

Mr. MCLAUGHLIN. This thing baffles the whole community, does it?

Mr. HEIDGESEN. Yes, sir.

Mr. LESHER. The secret of handling all sorts of weeds is cultivation largely, is it not?

Mr. PIPER. Rotation, with cultivation of crops; yes, sir.

Mr. HEIDGESEN. The seeds of these weeds, like Canada thistle, blow about and sow themselves.

Mr. LESHER. There is no way to prevent them from blowing. The thing to do is to cultivate them and keep them down and keep them from blooming?

Mr. HEIDGESEN. You can not cultivate a small-grain crop. That is impossible. And if the country is only suited for small grain, then we are up against the proposition that we have got to find some other suggestion than simply cultivation.

Mr. HAUGEN. Professor, I understand from your statement that you have given a good deal of study to thistle and to quackgrass, and you have made no progress or discovery. Now the question is, if more money is appropriated, can you give us any assurance that you can get any results from it?

Mr. PIPER. I can not subscribe to the statement which has just been made. I think we have made progress in the intensive study of some of these weeds like wild onions and quackgrass.

Mr. HAUGEN. I am speaking now of the thistle. Now, as to the destruction of the thistle and the quackgrass you have made no progress, have you?

Mr. PIPER. Yes, sir; we have.

Mr. HAUGEN. What progress have you made?

Mr. PIPER. We are able to show that by the carrying out of certain methods such weeds can be entirely destroyed.

Mr. HAUGEN. What are the methods?

Mr. PIPER. Those methods are not simple methods; they are not easy, slipshod methods. The general proposition to kill out quackgrass is, first, to mow it for hay, or, much better, to keep it pastured, when the root stocks will be confined to a shallow depth; then plow shallow; then thorough disking or harrowing every 10 days or 2 weeks. Farmers following that method have absolutely killed it.

HAUGEN. That will not destroy quackgrass in the State of or Minnesota. That has been tried out all these years. That ıd does not result in getting it, because we have tried that out ughly. That method is as old as I am.

STEELE. Is it not a fact that you farmers up there determined ld not be killed? Did not one of your farmer friends up there ear take some quack grass, hang it on his fence, and then the rear plant it and it grew?

HAUGEN. That may be true.

STEELE. That is my understanding as to quack grass. You ɔt kill it, so if you have it you have just got it.

HAUGEN. They do kill it; some kill it by sowing millet.

ı CHAIRMAN. Does that complete you statement?

HELGESEN. I find in your note underneath here the following: itional funds are urgently needed, especially to meet the con- demand for help from the South." A little farther down it "The demand from the South for aid on forage-crop problems ɔcome more insistent," etc. Now, I rather think the people of orth are themselves to blame for not getting more aid than we ɔtting. The South is insistent and they have succeeded, and now on I think you will have some insistence from the North, se we have urgent demands also, and I think the department to wake up to the fact that it has got to cover this country ver it is necessary.

HAUGEN. In addition to that, I would say that the members ıave been on this committee from the North heretofore have had lence in the department, and it has not been the practice of the ɜ of the North to come in here and ask for a special appropria- or some specific thing. We think that the department is in position to determine how and where this money shall be ex- d than we are. When we had a Secretary from the Northwest, ırse, we naturally had confidence in him, that he would look the interests of the Northwest as well as he would of the South any other section of the country. My understanding is that ly excuse or explanation given is that there is, and was, a greater for the investigation and work to be done by the department in ɔuth than there is in the North, and one might infer from that he people engaged in agriculture in the Northwest possessed a r degree of intelligence as to farming.

ı CHAIRMAN. No; I think the correct inference would be that bly the 5 men from the South on this committee of 21 have more gence than the other 16 men. [Laughter]

HAUGEN. I am not speaking of members of the committee. I lking now about the farmers. I have reference to their knowl- ɔf farming.

ı CHAIRMAN. Well, that is neither here nor there.

HELGESEN. They have probably had more nerve to ask for they wanted.

ı CHAIRMAN. Professor, have you ever succeeded in killing nut ı

PIPER. We have made no extensive investigations of nut grass That is the next thing that is on the list. Of course, that is ar nely difficult problem beyond any question. I do not know a

single man in the South who has ever succeeded in satisfactorily controlling nut grass.

Mr. HAWLEY. Is that confined to the South?

Mr. PIPER. Mainly.

The CHAIRMAN. I worked in my garden the whole summer and never did get rid of it. The more I worked the worse it grew.

Mr. HELGESEN. Prof. Piper said he thought there ought at least to be a survey made of the weed situation on the wheat lands of the Northwest. Have you got money enough to make that survey?

Dr. TAYLOR. It has not been included in the estimates.

Mr. HELGESEN. If it has not been included, just hand the committee a communication covering the matter as you think it should be.

Dr. TAYLOR. With reference to such a survey?

Mr. HELGESEN. Yes; with reference to whatever you think is best to be done. If a survey is all you think should be done in reference to that, give us a memorandum on that.

Dr. TAYLOR. That could be done; that is, a consideration of the point that has been raised and the question that has been asked could be made by the bureau and a statement furnished, preferably in the form of a letter from the Secretary to the committee, in response to that.

The CHAIRMAN. Suppose you do that, Dr. Taylor.

Dr. TAYLOR. If that is desired, particularly with reference to the accomplishment of such a survey as would determine the weed situation in North Dakota and throughout the spring wheat section.

Mr. HELGESEN. So that next winter you can come before this committee and tell us whether you think you can tackle that successfully or not, or whether anything can be done.

Dr. TAYLOR. I shall be very glad to furnish a statement along that line.

STATEMENT OF MR. R. A. OAKLEY, AGRONOMIST IN CHARGE OF CONGRESSIONAL SEED DISTRIBUTION, BUREAU OF PLANT INDUSTRY.

Dr. TAYLOR. The other part of this item, as stated, is the proviso for the purchase and distribution of new and rare field seeds. That has been referred to somewhat by Prof. Piper and was referred to in my initial statement. With reference to the details of that distribution, suppose Mr. Oakley outlines to you just what has been done in that line this year.

The CHAIRMAN. That will be satisfactory.

Dr. TAYLOR. In the Program of Work you will find this on pages 209 and 210.

Mr. OAKLEY. The distribution of new and rare field seeds is being continued the same as last year with the exception that it is being conducted on a somewhat smaller scale, perhaps, although we anticipate distributing approximately the same number of packages as last year. It has been confined to forage crops and to new varieties of cotton. It has been projected first on the new and rare crops that are available; second, on the needs of the various sections, and, last of all, we have attempted to make as nearly an equal distribution as possible throughout the country.

; year we distributed something like 170,000 packages of forage
eeds, including approximately 20,000 packages of alfalfa seeds,
of cowpeas, and a larger number of packages of grain sorghums
udan grass. This fall we asked for reports from as many
ators as we thought we could reach, and we have now in our
out 10,000 such reports. The results show that the distribu-
as been a success, and in a great many cases the farmers have
ery enthusiastic.
points that have been brought out most clearly are that this is
ellent means of getting a new crop before the people. It
s a great many people, it reaches the right kind of people, and
e accomplished perhaps more in this way than we have ever
plished in the introduction of a new field crop.
ANDERSON. You say you sent out about 170,000 packages?
OAKLEY. Approximately.
ANDERSON. Do you send out a letter asking each man to whom
age of seed is sent to make a report?
OAKLEY. That is the intention. We have not been able to get
of them so far. We have reached about 50,000.
ANDERSON. Have you any idea now how large a percentage
ies you get from those you ask for reports?
OAKLEY. Out of 50,000, we have received approximately
.
ANDERSON. That is about 20 per cent.
OAKLEY. Yes, sir.
STEELE. In how long a time?
OAKLEY. From the 15th of November until the 1st of January.
ANDERSON. Do you have any considerable portion of volun-
ports?
OAKLEY. Yes; quite a number. Those, however, are not in-
in this.
ANDERSON. Could you say how large a proportion of voluntary
; you have received?
OAKLEY. The proportion is comparatively small, although the
number is large. The proportion would perhaps be less than
cent.
HOWELL. How is your list, these 170,000 names, made up?
OAKLEY. Lists are submitted to us by Senators and Repre-
ves in Congress, lists prepared by them, and the distribution
lucted entirely in cooperation with the members.
ANDERSON. In these requests you made for reports, were they
on a certain proportion, on all of them, or did you get a com-
eport from some section and none from others?
OAKLEY. We picked out representative sections and sent
ts for reports to every man in that section that received seeds.
ANDERSON. And in those cases you got substantially 20 per
replies?
OAKLEY. Substantially 20 per cent to date. I do not know
he ultimate result will be.
ANDERSON. You will not get many more?
OAKLEY. Possibly not. The letter-writing season of the
is rapidly passing.
STEELE. That was from the 1st of November, 1915?
OAKLEY. From November 15 to January 1, 1916.

Mr. [illegible]

Mr. [illegible]

Mr. [illegible] the reason why you have not got a large [illegible] a great many of them were sent to th Senators and Representatives, and they never forwarded them t you.

The CHAIRMAN. I would like to say that.

Mr. [illegible] I [illegible] to this. We find it ver necessary [illegible] with its distribution to cooperate closel with the experimental offices, and, as you will see, we have confined th distribution so far very largely to forage crops. How the distribu tion will ultimately develop we are unable to state.

Mr. HAWLEY. This increase you are asking for, is it due to the in crease of the number of Members of the House?

Dr. TAYLOR. No; it is with a view to making possible the devo tion of $60,000 to this work which, as the act came through las year, was impossible. It may be recalled that the department's est mate last year was $50,000. The Senate increased it to $100,000 In conference that was changed to $60,000 under this proviso, with out increase of the total for the forage-crop item above the amoun that the department had estimated for when the proviso had stoo at $40,000. So that we were confronted by the alternative of sen ou ly reducing our forage-crop investigational work which Pro Piper has just been describing or using a less amount under the pro viso than Congress had authorized might be so used. We protecte the investigational work and devoted only the $46,530 to the di tribution. We believe that the full $60,000 could be very useful expended in this type of distribution.

The units of distribution are so sized that a field test, a practic field test, is possible with each thing that the department sends ou and the seeds are selected with reference to their probable usefulne in the sections where they are to go. It is the first effort that th department has made in recent years, at least, to place pure, high grade seeds of the type in the regions in the hands of the farmers i sufficient volume to make a practical field test, and the character o all reports received indicates that it is accomplishing in large degre the purpose that was intended. I may say that 20 per cent of th reports from requests sent out by the department is an unusuall large percentage.

The CHAIRMAN. That is what I was about to suggest.

Dr. TAYLOR. Although as a percentage statement it does not ap pear high. In actual experience, in communication with farmers of whatever character, this is a high percentage.

Mr. ANDERSON. I do not want anything I said to indicate that considered it anything else, because my own experience is that th percentage of these replies is ordinarily very much less than 2 per cent.

The CHAIRMAN. Yes; that is also my experience.

Dr. TAYLOR. We usually feel that we are reaching the farme pretty effectively in an inquiry if we get 10 per cent of replies t inquiries that we make, and this involves a fairly definite and fairl detailed report. It involves considerable effort on the part of th man.

Mr. ANDERSON. I should like to ask you this question, Dr. Taylor. My experience has been that you are much more likely to get reports upon a seed proposition which is fairly successful than you are on one which is pretty generally unsuccessful. It is the successful fellow, as a rule, who reports, not the unsuccessful one.

Dr. TAYLOR. That is usually the case. The unsuccessful fellow may feel that his failure reflects upon his efficiency as a farmer.

Mr. HELGESEN. I think if you can increase this distribution of new and rare seeds 100 or 200 per cent and cut out your garden seeds, you would be rendering this country a great service.

The CHAIRMAN. I should not be surprised if Dr. Taylor did not think that himself, but unfortunately Congress does not think that way.

Mr. HELGESEN. There are too many politicians.

The CHAIRMAN. Yes. Does that complete your statement?

Mr. OAKLEY. Yes.

The CHAIRMAN. On page 86, gentlemen, "The purchase and distribution of valuable seeds." Are there any questions on that item? It is the same item as last year; there are no changes?

Dr. TAYLOR. It is identical with that which is in effect this year and was last year.

The CHAIRMAN. We are very much obliged to you, Dr. Taylor, and we feel that you have given us the best statement of the work of your bureau that has ever been given this committee—certainly since I have been on this committee.

Dr. TAYLOR. I will say, Mr. Chairman, that it has been a pleasure to discuss the work of the bureau with the committee in this way, and I feel from the standpoint of the bureau that it has been distinctly helpful to its work that this patient and somewhat detailed hearing has occurred.

House of Representatives,
Committee on Agriculture,
Wednesday, February 5, 1913.

After the transaction of other business

STATEMENT OF THE HON. SYDNEY ANDERSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MINNESOTA

Mr. Anderson. I would like to make a brief statement. The item to which we wish to direct particular attention is that at the bottom of page 62, which provides—

For the investigation and improvement of methods of crop production under subhumid semiarid or dry farm conditions, $100,000: Provided, That the limitation in this act as to the cost of farm buildings shall not apply to this paragraph, $100,000

The Chairman. What amendment would you suggest to that paragraph?

Mr. Anderson. We desire to propose to that section a further proviso, as follows:

Provided, That no part of this appropriation shall be used in the propagation of trees, cuttings, or seedlings, for distribution.

The purpose of that amendment, I would say very frankly, is to prevent a practice which has been established in the Mandan, N. Dak., station.

About a year ago the authorities at the station issued a circular, which I will not read in its entirety, but which we shall put into the record, which reads in part as follows:

In accordance with an act of Congress, dated August 10, 1912, which provided for the establishment of the Northern Great Plains Field Station, this station will assist in cooperative shelter-belt development, free of charge to farmers in the Northern Great Plains area, comprising North and South Dakota, west of the one hundredth meridian, and Montana and Wyoming east of the 5,000 foot contour line. Trees will be available in the spring of 1916, but application for these trees must be received prior to April 1, 1915. The purpose of this cooperative shelter-belt development is to encourage the growing of windbreaks on the prairies of the northern portion of the Great Plains.

Mr. McLaughlin. How large a quantity of them would be available for distribution in that way?

Mr. Anderson. About 800,000 trees this year.

Mr. Haugen. Worth a dollar a thousand?

Mr. Anderson. The testimony before the committee, I think was to the effect that they expected to make probably a thousand plantings a year for the next six years, and perhaps longer. Last year we took the matter up with the department, and at that time we

rged, first, that there was no authority in the act establishing stations for this sort of a distribution; second, that the plan goes far eyond legitimate demonstration; and, third, that the method of arrying on the project was such as to decrease rather than to increase the growing of trees in that section of the country. After he matter had been taken up with the department, I received a etter from the Assistant Secretary, which we at that time interpreted to mean that there would be such a change of plan as to liminate the objectionable features.

It now appears that the department intends to go on with its riginal plan in substantial accordance with the method which was utlined originally, notwithstanding its representations to us.

Mr. McLAUGHLIN. Under what words of that appropriation do hey find authority to do what you speak of?

Mr. ANDERSON. I will read the act, so far as it applies to this ation.

Mr. HAUGEN. Have you the original act there?

Mr. ANDERSON. The original authority was in the Agricultural appropriation act for 1913, in which a subappropriation for general xpenses for the Bureau of Plant Industry reads as follows:

For the investigation and improvement of methods of crop production under miarid or dry-land conditions, $125.000: *Provided, however,* That the sum of 50,000 of this amount, or so much thereof as may be necessary, shall be used r the purchase of land and equipment and the construction of buildings necesary to establish, equip, and maintain an experimental farm in the northern ction of the Great Plains area to demonstrate the kind and character of lants, shrubs, trees, berries, and vegetables best adapted to the climate and soil f the semiarid lands of the United States: *And provided further,* That the imitations in this act as to the cost of farm buildings shall not apply to this aragraph."

That is the authority of the department for the work which is eing done at that station.

Mr. McLAUGHLIN. You have given attention to this. What do ou think in what you have read from there confers authority to o into this business of raising trees and sending them out as has een done?

Mr. ANDERSON. I think it might perhaps confer authority to establish here and there a demonstration plat, but the question which hen arises is whether the establishment of 1,000 demonstration plats year comes within this provision. I think it clearly does not; hat it then takes on a character of a distribution which certainly it eems to me could not have been contemplated under that language.

Mr. HAUGEN. The distribution is the demonstration. The demonstration consists of the distribution of these plants.

Mr. ANDERSON. I hardly think that that is a fair conclusion. If he Department of Agriculture can in every case where the word "demonstration" is used in connection with a station, propogate eeds, plants, cuttings, bulbs, and everything of that kind, and distribute them wherever they please, it seems to me that that goes far eyond anything which was ever intended by Congress.

Mr. McLAUGHLIN. But, of course, in any instance and in all put ogether, only to the extent that Congress is willing to furnish oney, knowing what is being done with it and the possibility in the ork.

Mr. ANDERSON. Quite true.

Mr. HAUGEN. I think that such distribution for demonstration purposes goes out to the people, and I think it is entirely proper. The only question is as to the limitation per tract would be. That is what he refers to.

Mr. ANDERSON. Yes.

Mr. HAUGEN. I took that up in the Mandan station last year, and they tried to keep it down to put the demonstration work, putting it a few plants to a tract and instructing the farmers as to how to cultivate what the farmers would agree to cultivate and keep the trees growing. Now, if they had kept within that limit it would not only have been instituted by the act, but I think it would have been the very best advertising for the nurseries of the country that they could possibly have, because a great many people—in fact, most of the people believe that trees can not be successfully grown in the semiarid region. That has got to be established before there will be any great sale of trees by anyone. I took it up with the nursery men and they agreed that if it was kept within certain limits it was a good thing for them. They also said if it was not kept within those limits it would constitute an absolutely free distribution of all the trees which was what all the farmers want.

Mr. MCLAUGHLIN. Are the trees or cuttings of a character that relate directly to agriculture, or are they shade trees?

Mr. ANDERSON. Shelter belt trees.

Mr. HAUGEN. I suggest that we can expedite matters by hearing Dr. Taylor who can cite the authority - -

Mr. ANDERSON (interposing). I do not want the time occupied by Dr. Taylor. Mr. Cashman is here and I want him to make his statement to the committee, and if Dr. Taylor wants to make a statement after Mr. Cashman gets through I have no objection.

Mr. HAUGEN. You question the authority of the department?

Mr. ANDERSON. I question the authority, and I question the policy of carrying on the work in the way in which it is carried on at this time.

Mr. MCLAUGHLIN. Can you not answer in a word the character of the trees and cuttings that have been sent out under this appropriation?

Mr. ANDERSON. Yes, sir. This is the first year, as I understand it, that actual planting is to be done. I have here a list of the kind of stock which is available for distribution this year. That includes willows, straight cuttings, 200,000 available, number required, 195,845; poplars, straight cuttings, number available, 220,000, number required, 204,870; and when I say "number required" I refer to the number required to fill applications now on file box elder, seedlings, 1 year, number available, 225,000, number required, 200,875; caragana, seedlings, 2 years, number available 16,000, number required, 48,440; caragana, seedlings, 1 year, number available 4,465, no applications; willows, rooted, cuttings, number available, 16,775, number required, 15,044; poplars, rooted, cuttings, number available, 26,615, number required, 25,000; green ash seedlings, 2 years, number available, 7,800, no applications; Russian olive, seedlings, 1 year, number available 975. Approximately 800,000 trees are available for planting this year.

STATEMENT OF MR. THOMAS E. CASHMAN, OWATONNA, MINN.

Mr. CASHMAN. I represent the Northern Nurseries Retail Association, made up of nurserymen in North and South Dakota, Minnesota, northern Iowa, and Wisconsin. I do not come to you gentlemen asking for a large appropriation or for a subsidy. We simply ask for the discontinuance of a policy which has been pursued by the Bureau of Plant Industry of the Department of Agriculture of this Government which threatens to destroy our business.

About a year ago, as Congressman Anderson stated, the nurserymen of the Central West learned through the newspapers of North Dakota, South Dakota, and Montana that it was the policy of the Government to distribute indiscriminately wind-break stock and shelter-belt stock to the farmers residing west of the one hundredth meridian. Of course we were very much excited, because a large part of our business is made up in the production of wind-break stock. We found that they were attempting to distribute free trees that we were propagating, and, to our mind, not following the general intent of the law. As I read the law, it provides that this station shall originate, that it shall produce something that does not now exist, but which may be proved to be more beneficial, something more hardy, more adapted to that western region, and we hailed with joy this proposition when this bill was first introduced and first placed on the statute books. We felt as though not only the farmers, but the nurserymen were going to be helped to a large extent. We never thought for a minute that these young men out there were going to raise millions—I say it advisedly; I have been told that they are raising millions of such trees as box elder, ash, etc., and that class of trees that the nurserymen have been selling in that section for the last 10 or 15 years.

It is true that the settlement was sparse in the early days, and there were not many people to sell to, but I, myself, representing the nursery at Owatonna, we have been operating in that section for 10 years and we have proven beyond doubt that the varieties of trees that these men are propagating are not an experiment. They have been proven to be hardy in that section. They have proven beyond doubt that they will give splendid satisfaction when properly cared for.

Now, then, what do we find? We find that this large sum of money invested by the Government to raise and propagate and originate new varieties is used for the purpose of raising the nursery stock—distributing nursery stock indiscriminately to everybody in that locality who may apply and who may care to live up to certain requirements that they provide for.

Mr. MCLAUGHLIN. Without any cost whatever?

Mr. CASHMAN. Without any cost whatever, except express charges. Now, then, where does it leave us? I have read the statements here by Mr. Chilcott, who says that this Government is following the policy adopted by the Canadian Government for a number of years, and he goes on and has the temerity to say that that policy in Canada has actually encouraged the purchase of nursery stock from nurserymen. I want to say to you gentlemen that we have operated in Canada for the last eight years; that is, up until three years ago. We operated there five years—it has been eight years since we

started and we were compelled to leave that field. Why? Bec[ause] about the only thing that will grow in that severe western [cli]mate is stock. The only thing that will thrive out the[re] is the government of Canada, and they distribute [trees] free of charge. The salesman would go out to the farmer and [say] "We want to put a windbreak around your place. It looks d[ull] to have those trees and bushes interfering with your comfort and [pro]fit of your stock. We want to sell you some seedlin[gs] [and] help you get those windbreaks over here at In[dian] Head." "Did you get any last spring?" "Oh, no." "Did [you] plant any last?" "Well, I neglected it; I forgot it." Or, if [in] some cases they were told that they did not have suffi[cient] stock to supply that, but would in the near future."

The result was that he did not give an order for wind-breaks to the nurseryman because he believed he could get that stock free of charge from the Government at some future time. The r[esult] was there was no order placed. Mr. Farmer did not, as a t[hing], send to the Government for those trees. Therefore the [year] went by. The trees were not planted, and on that account the tre[es] territory that exists in that country. If it had not been for Indian Head station millions of trees might have been protecting homes of that country. Splendid groves might have been built i[n] that section, because when a nurseryman takes an order from farmer Mr. Farmer knows that he has got to pay for it, and w[ill] not sell him unless he is good. He knows he has got to take t[he] When his money is invested he plants them and takes care of t[hem] and so far as the instructions are concerned, Mr. Taylor, your inst[ruc]tions are almost verbatim—word for word—of the instructions [sent] out by most all of the reliable nurserymen of the Central West, te[lling] the farmer that he must cultivate and prepare his land before p[lant]ing; that he must cultivate his trees after planting, telling him [when] to and where to plant those trees.

We have men on the ground that are as much interested as [the] boys are who are representing the department, men who are [not] afraid to go down and dig and plant a few trees. The departm[ent] does not promise to plant anything. They merely promise t[o] around and make a few sketches, make a few drawings, and ad[vise] the farmer whether to plant his trees north or south, east or w[est] how to keep his rows straight; and all that sort of thing. He [does] not see that the farmer takes those trees out and plants them. [He] does not help them plant them or cultivate them. There is not [a] compulsory upon the farmer to plant and to take care of t[he] trees.

Now, I am going to read, with your permission, in part, som[e] the documents that the department is sending out.

Cooperative Shelter-belt Planting in the Northern Great Plains.

It goes on and tells about the agricultural appropriation ac[t] 1913 which makes certain provisions, and it says that the obje[ct] this work is to stimulate interest in the planting of shelter belts, [and] in this way to assist the farmer in improving the home surround[ings] It tells what the instructions are, and the farmers wishing to [co]operate in the planting of shelter belts should make applicatio[n] the regular form for the purpose, etc. It goes on and tells a

the territory west of the one hundredth meridian, and I find that Mr. Chilcott or Dr. Taylor, or whoever made the statement, that they had moved that meridian 2° east, and are now operating west of the ninety-eighth meridian, which gives them more territory.

They say that any person owning or homesteading a farm operated under dry-land conditions, within the area above described is entitled to make application for cooperative shelter-belt planting, provided such owner resides on such farm.

Now, that means every farmer, every homesteader, residing west of the ninety-eighth meridian that owns his farm and lives on it is entitled to participate in this free distribution.

Any public school, either in town or in the country, may apply for a shelter-belt planting, provided that such schools have sufficient land of suitable type. Applications for such schools should be signed by a member of the school board who will be responsible for the planting and care of the trees. No trees will be furnished for planting on land that is irrigated, or likely to be irrigated, as this work is limited to the growing of trees under dry land conditions.

Then they go on giving the location and the size of the shelter belts. The size of the planting will vary from one-half of an acre to 2 acres, and where the total area exceeds 1 acre, only one-half of the ground should be prepared for planting the first year.

You understand, gentlemen, that in order for these boys to demonstrate that a willow or a box elder will grow out in that territory, they have got to plant it by the thousands; they have got to put out two whole acres; they have got to give that farmer all the windbreaks he will ever need, to show that the trees will grow. And, furthermore, every farmer in that country is advised to plant from one-half of an acre to 2 acres of this windbreak stock.

Mr. McLAUGHLIN. I do not want to interrupt the course of your talk, but I would like to know if the farmers out there have made serious complaint of their dealings with your company, or whether the department in its investigations criticizes the kind of stock and the strength of it, or anything of that kind.

Mr. CASHMAN. I will be very glad to answer that question. I want to say that we have been operating in that section of the country for the last 10 years. I did not know until about 24 hours before starting that I was coming, and I did not have time to go over the books in the office, but I had the boys make up a list of these trees that we have sold west of the one-hundredth meridian during the last three years. I did not have time to go back further. I will show you the account of the number of trees, and I want to say that we replace free of charge any trees that fail to grow. We do that to cooperate with the farmer. We are using that dear word "to cooperate" with him. That word covers a multitude of sins. In 1913 we sould 696,134 trees of the varieties that the station is putting out. That does not include any other kinds of nursery stock, however. We replaced that year on all trees previously sold by us only 3 per cent of the total sales. As you know, 1914 was a very dry year, and the rainfall was very light and the crops were poor. We did not operate to the extent in that section that we did the year previous. We only sold 509,000 that year, but we took care of the replacing.

In 1915, which was a better year, better crops, more rainfall, we sold in that region 906,770, with a replacing of 8 per cent. That 8

per cent was a little heavier, because the year before was a bad year to start trees, and I want to say to you gentlemen, if it had not been for this literature that had gone out from this Mandan station, our sales would have been probably doubled. We met dozens and dozens of farmers who said, "Mandan is raising all of the trees we want."

Mr. OVERMYER. Do you know how many were actually sent out by the department last year?

Mr. CASHMAN. No.

Mr. STEELE. What do you sell box-elder trees—yearlings—for?

Mr. CASHMAN. We can not raise a tree that is big enough to send out in one year. We are situated unlike the people in Missouri. We live up north where the seasons are short, and we do not sell any box elder less than 2 years. Our retail price for the 12 to 18 inch trees is $10 per thousand.

Mr. STEELE. What do you get for your ash trees—the yearlings?

Mr. CASHMAN. The same price. The 18 to 24 inches we get $12.50 per thousand for. Then we have a higher price for the 3 or 4 year old trees, depending upon the size.

Now, a statement has been made here by a gentleman representing the department, and I do not wish to find any fault with him except to say that he is mistaken as to the actual cost of producing those trees.

Mr. HAUGEN. He said $1 a thousand.

Mr. CASHMAN. If he confines himself to cuttings, I would say that it is correct.

Mr. STEELE. Here is the point I wanted to raise. I planted 7 acres of ash trees 27 miles north of Pierre. I think I got 14,000 or 15,000 trees—ash trees, yearlings—at $2 a thousand.

Mr. CASHMAN. How old were they?

Mr. STEELE. Yearling trees.

Mr. CASHMAN. Is it fair to inquire where you purchased them?

Mr. STEELE. At the Sioux City Seed and Nursery Co.

Mr. CASHMAN. Do you know where they got them?

Mr. STEELE. I do not know.

Mr. CASHMAN. How large were they, please?

Mr. STEELE. Six or eight inches.

Mr. CASHMAN. Perhaps they were grown farther south than Sioux City.

Mr. STEELE. I want to say that I had very good luck. Pierre is about the same climate as yours.

Mr. CASHMAN. I have given you the retail price, $10 and $12.50 per thousand, that we charge to the farmers, and Mr. Chilcott said in his statement that it cost the station 10 times that $1 per thousand to take care of those operations connected with this matter. So that this $1 per thousand that he claims is only the expense of propagating. He claims that the expense of handling is $9 a thousand; and, of course, we have the same expense that this station has, only more so, because we have got to pay the agent's commission. We pay the freight, the station does not. We replace free of charge, the station does not. We have a dozen things that enter into our dealing that we are compelled to take care of that the station does not. Therefore there is no comparison and no parallel.

Mr. STEELE. I want to say that so far as the tree planting is concerned that is something that I know something about. I would

not plant a tree over a year old, and I would plow them under and save the bud out. I have planted thousands and thousands of trees, and I have always made a success in planting the little trees and plowing them in—that is, for wind breaks.

Mr. CASHMAN. I wish to say, for your information, that if you order trees grown in North Dakota or Minnesota a year old, you would send them back, because we do not get much in size in the first year.

Mr. MCLAUGHLIN. In answer to my question, all you have said is how many trees you sent out and how many trees you replaced. Is that all the answer you have to make as to whether there are any criticisms on the part of the people?

Mr. CASHMAN. There never has been any complaint. We have had no information whatever from the department or from anybody else that we were not giving good satisfaction, and our sales on our books will show that our customers are pleased with our work, because our sales have steadily increased.

Mr. OVERMYER. Did I understand you to say that your sales were reduced about 50 per cent last year by reason of the free distribution?

Mr. CASHMAN. Yes, sir; I believe our sales were reduced about 50 per cent last year on account of free distribution. We are only one of about 30 companies operating in that section.

Mr. HAUGEN. I understood you to say that you appeared here as a representative of all the nursery people?

Mr. CASHMAN. Yes; I represent about 300 nurseries in that Central West.

Mr. OVERMYER. Have you any idea about how many customers these 300 nurseries have? The reason I am asking that is that I see in the statement here of Mr. Chilcott's, of which you have a copy, that he only had 732 applications and that they have actually sent out trees to 461 applicants and are able to fill about 700. How large a patronage have these companies that you say you represent?

Mr. CASHMAN. Well, as to that, I am not prepared to say; but I want to say this: That our salesmen call upon all men who are able to buy.

Mr. OVERMYER. But your books would show about how many patrons you had?

Mr. CASHMAN. The past year we sold about 1,000,000 trees; wind-break trees west of the 100 meridian. I would judge that the average sale would be about 500.

Mr. HELGESEN. You are speaking now for the nursery firms you are representing?

Mr. CASHMAN. Yes.

Mr. HELGESEN. Do you only intend to answer for your own firm and for the other firms?

Mr. CASHMAN. I can answer for all of the firms in the Northern Nursery and Retail Association. They are men that are looked up to in their community and their dealings are most honorable. They stand high in the community in which they live. Their reputation is good at home and on a field where they operate. There is no class of men handling a business that requires so much honorable dealing as does the nursery business, because there is so much chance for

criticism, more than probably any other line, because it is hard to get the farmer to carry out your plans.

Mr. McLAUGHLIN. You spoke of the competition and the injury and destruction of your business. You have a right to speak of that, and it is proper for us to take it into consideration, and what action to be taken is to be determined later: but do you think there would be serious competition or any serious danger to you by the use of such an amount of money as heretofore has been appropriated annually, or are you simply calling our attention to the danger that is facing you if we continue the policy and, perhaps, largely increase the appropriation?

Mr. CASHMAN. It does not make much difference, gentlemen, to what extent those trees are sent out. The very fact that the farmer believes that he is going to get trees free of charge is going to cause him to wait for you people to produce them for him. The result is that it is going to retard the planting of trees in that section. He will wait for the Government. You know that the average man is careless about the planting of trees. It takes a salesman to go out and induce a man to plant trees, and I want to say that I understand that the department has sent out men to encourage the farmers and talk the farmers into taking those trees the coming spring. I have a letter here from a nurseryman, Mr. Hilborn, at Valley City, N. Dak. He says that a big part of the expense at the Federal station at Mandan is incurred by their traveling inspectors, who are really nothing but salesmen out hustling for free orders. He says that "We encountered them up west of Great Falls out getting the farmer to order free trees."

The CHAIRMAN. They had better discharge them as salesmen if they do not get any more orders than it is shown that the station put out. Would you not discharge a set of salesmen like that?

Mr. CASHMAN. It depends on how long they were out.

Mr. STEELE. The nurserymen are satisfied with the experimental planting?

Mr. CASHMAN. Yes.

Mr. STEELE. They do not want them to distribute trees free of charge to the people in that locality?

Mr. CASHMAN. That is it, exactly.

Mr. STEELE. I agree with you entirely.

Mr. HAUGEN. The distribution of these trees is on a par with the distribution of seeds, is it not?

Mr. CASHMAN. Exactly; only under a different order. Now, under the distribution of trees the plan seems to be to furnish the farmer all the trees he is ever going to need. He says that eventually, if not now, he can get those trees free of charge, and therefore he will not buy of the nurserymen, and instead of helping the cause it will retard the progress of planting trees.

Now, if the station would work along the line of the station at Brooking, S. Dak., which has received aid from this department, and which Mr. N. E. Hanson, of Brooking, S. Dak., is in charge of, the horticultural department, they would do a world of good to the people of that locality. He has gone to Siberia and to the remotest parts of China, and he has brought back hardy varieties of plum, of apple, and other things of that kind. He has cross-fertilized these varieties with our natives. He has brought out dozens of native

varieties, for instance, the Wanita plum, the Opata plum, splendid varieties. He tries them out on the ground, and then he announces to the public generally, "I have a good thing. It ripens at a certain stage. The fruit is of a certain size. I will charge you so much money for it." The public is asked to buy at that price. They pay their money for these new revelations, and the nurseryman has an opportunity to get them. He does not give them away, but he asks the people to pay what the stock is worth.

For instance, two years ago Prof. Hanson announced to the public that he had perfected the Wanita plum, a great, big, beautiful plum. It has proven hardy in that section, and he said that he would sell for a certain price. We gladly bought, and the farmers bought, and the nurserymen are propagating that variety. He does not go on and propagate them by the millions. He originates and then hands it on to the nurserymen for propagation. He did the same thing with the Opata plum, with the raspberry, and the strawberry that he has originated, and the same is true of the experimentation in Minnesota, where Mr. Harlson, a man of ability and experience, was placed in charge. He first brought out the 1017 progressive strawberry and nine different varieties of plums that appear to be superior to any of the varieties grown in that territory.

Mr. STEELE. Was that true of the Siberian alfalfa? I bought that at $5 a pound.

Mr. CASHMAN. Mr. Harlsen has introduced an alfalfa in South Dakota and North Dakota that will bring millions to the people of that country, a splendid thing. The Brookings station and Minnesota station is run in a way that it does not injure anybody's business, and helps everybody. When this gentleman brought out these new varieties did he give them away? Oh, no. He said, "Here, this is a good thing; I want so much a piece for this to help carry on the expenses of this station," and the farmers bought them, the nurserymen bought them, and Mr. Hansen and Mr. Harlsen immediately goes out of the business of propagating those particular varieties. They endeavored to originate new and better varieties; they are trying to originate something better than we already have; they are conducting great institutions, and, as Gov. Lind, of Minnesota, said a year ago, holding up one of these beautiful plums that Harlsen originated: "If this man does no more than to bring out this wonderful plum it will be worth millions to the people of this Northwest."

Now, that Mandan station is a valuable institution if it is properly handled.

Mr. HAUGEN. What have you to say about the nursery experimentation in Nebraska? Stock is distributed from there, as it is from North Dakota.

Mr. STEELE. You know what the ash tree is; you know what the box elder is; you know all the hardier trees.

Mr. HAUGEN. And these are distributed to the farmers, are they not?

Mr. CASHMAN. Gentlemen, as I understand it, the object of that station out there and of all the stations is to originate something new, something better.

Mr. HAUGEN. I think at the one in Nebraska the nursery stock is distributed free of charge to anybody who may apply for it. Is that right, Doctor?

Mr. TAYLOR. That is true.

Mr. CASHMAN. I am not posted as to that. Do they actually compete with the nurserymen in common varieties?

Mr. HAUGEN. They distribute free of charge, as I understand.

Mr. CASHMAN. Perhaps it is the new kinds that they distribute free of charge.

Mr. HAUGEN. No; I think not.

Mr. CASHMAN. To give you something of the intent and purpose of the way that they wish to carry out these matters in North Dakota I wish to go a little further.

Now, they go in and say that if the inspector finds conditions unfavorable for planting the following season he will tell the farmer what necessary preparation should be made, and either postpone the application to some future date or cancel it as the applicant may elect. In exceptional cases, where it will not be possible for an inspector to visit the applicant, the necessary information will be secured by mail.

In other words, those young men who go out to find out whether farmers have suitable places to plant trees, and they find a man who lives a long distance from the railroad station, he does not have to go over and inspect the ground, and you will probably find that that young man will probably encourage the planting of trees near large centers of population, in thickly settled districts, where he can live at a good hotel and not be put to the miseries that he might receive 25 miles away from the railroad station, and who are the people who should be helped, if any.

The principal trees used are box elder. Just think of it! This Government appropriating money and going into the business of raising box elder, something that will grow anywhere where there is any soil for it to grow on, except sand and gravel, and any farmer that has any sense at all knows enough not to plant box elder in sand and gravel; and then the ash, elm, poplar, and willow. [Reads:] "Other kinds of known hardiness may be used in certain plantations. The kind of trees selected for shelter belt will be those believed to be best adapted to the local conditions of soil and moisture. For the work described in this circular no fruit trees, evergreens, or ornamentals will be supplied."

You understand what they say—"this circular"; but it does not prevent them from sending out other circulars and other trees free of charge later on, and I understand at the Mandan station to-day there are 40,000 apple trees grown on that station, of varieties that are hardy in the North. Why have they got to plant 40,000 in order to demonstrate their value? Would not a few hundred be sufficient to demonstrate, just as this gentleman in charge of the Minnesota station does? Hansen and Harlsen are not going into the nursery business. They say they can do more good for their people by working on the new creations and trying to bring out something better than to go into the nursery business and give their time and attention to something that now exists.

Mr. HELGESEN. Do you consider a box elder a shelter tree?

Mr. CASHMAN. It is hardy. It is not the best there is, by any means, but there are locations where nothing but the box elder and ash will su[illegible] at the present time.

Mr. HELGESEN. After 30 years' experience with them I would not ant them if you gave them to me.
Mr. CASHMAN. You would not as an ornamental tree, but you ould as a windbreak.
Mr. HELGESEN. I would not plant them as a shelter tree. They do t amount to a row of pins.
Mr. STEELE. What would you plant?
Mr. HELGESEN. Willows and birch are the best things up in our untry. The ash is a very hardy tree.
Mr. STEELE. Ash and box elder are about the only trees in South kota.
Mr. CASHMAN. In the dry lands in that district the ash and the x elder are about the most substantial.
Mr. HELGESEN. Of course box elder has more diseases than anying else on earth.
Mr. CASHMAN. There is one thing I want to bring to your attenn besides what I have already spoken about, and that is as to how ey make applications; what they say to the farmer in making plications. They tell them to read very carefully the circular to d out if they live in the district where they can get trees free of arge, and then they say that applications must be sent in before pril 1 in the year previous to the time the plantings are to be made. or example, an application for trees to be sent out in the spring f 1917 must be received on or before April 1, 1916. If the applicaon is received after this date the trees can not be furnished until 18.
There is nothing in that but what would convey the impression at it is a free-for-all proposition. Everybody is entitled to these ees. Everybody is entitled to half an acre to two acres, according this circular, and new circulars can be sent out later on allowing em more.
Why do they say make application before April 1? So that they ay make preparations for next year's crops. As to willows and oplars, they can secure in one year from cuttings 3 to 4 foot trees one year. If we knew in our own business that we were going to ave 100,000 trees sold we would set out cuttings enough to take care f that 100,000. They undoubtedly will do likewise. And they say they can not furnish one thing, they are allowed to substitute. hey are going to take care of the farmer in some way or somehow. here is no limit except when the stock is exhausted.
I am sorry that the time is short. Now, the circular refers to the re of trees when received. I think it has been copied from some the nurserymen's books. There is no one syllable in that article at you will not find in the instruction book of every nurseryman in e country.
They say that where five or more men in any locality put in their plication they are very much more likely to get the trees.

SPECIAL NOTES CONCERNING THE 1916 DISTRIBUTION.

On account of the uncertain number of applications that will come in for 1916 stribution, and in order to economize in the necessary inspection, it has been cided to give preference to applications which are received from communities ving five or more applicants. This should stimulate the farmers of one cality to get together and send in their five or more applications at one time. ch action will bring the best results.

What does that mean? It means that Mr. Farmer is going hustle. He is going to say to his neighbors, "Mr. Jones, my chan are much better if you and you will make application," and t result will be that all farmers will endeavor to get on, the stock w be distributed in the closely-settled sections of the country, near to the big towns, and the fellows that will get those trees will be the communities that need them the least. That will be the result.

Now, as Congressman Anderson has stated, there were appli tions for a certain number of trees this year.

Mr. OVERMYER. You saw Mr. Chilcott's statement here. Do y think nursery stock has been increased tenfold in the territory Canada in which the superintendent of the work in Canada w situated; in other words, that the result of the Government dist bution of these plants and seedlings had increased the demand t fold for nursery stock in that territory? Did you see that statemen

Mr. CASHMAN. I saw that statement, and I want to say that think—and I wish Mr. Chilcott was here—that he is either mistake that he has been misinformed, or that he wishes to create a wro impression.

Mr. OVERMYER. He quotes the superintendent of the work Canada.

Mr. CASHMAN. Yes.

Mr. OVERMYER. He said that the statement was made by him the superintendent of the work in this country.

Mr. CASHMAN. To give you an illustration, we operated to a lar extent in the Provinces of Saskatchewan and Alberta eight years a and up to three years ago. We were compelled to pull out from th field, because that station was furnishing all the trees that could supplied in that section; not that they were furnishing any quantit not that they were taking care of the demand or the wants, but th had conveyed the impression in the minds of the public that th could have that stuff free of charge, and there was not any need object in ordering from a nurseryman, even though they had to wa a few years.

We could not sell windbreak trees in that section, and you can n do it to-day. We could sell currants and gooseberries. I would l glad to show you our books; our sales during almost all the time th we operated there was currant and gooseberries and raspberries, bu the business was so small as compared with the very great expens incurred that we were compelled to withdraw from that field, and s has every nurseryman in the Central Northwest, because of th Indian Head Station, that did not supply one-tenth part of wha ought to be planted in that section, but the farmers have been taugh and educated that they could have that stuff free, and therefore wha is the use of buying it from a nurseryman?

Mr. OVERMYER. They would not buy, but would put off buying fo a year or two in the hope that they could get it free if they had t wait a year?

Mr. CASHMAN. Yes, sir. They are promised that if they can no get them this year they will probably get them the next year.

Mr. HAUGEN. And the fact that the field is not covered by sales men?

Mr. CASHMAN. Oh, yes; if the Government would put out sales men that stuff free of charge.

Is it a fact that it is the policy of the United States Government to un any legitimate business out of existence? If you want to go nto the nursery business, charge a fair price for it. We are not fraid of honest competition, although we do not think we ought to e compelled to enter into competition with the Government.

Mr. STEELE. In other words, you want to make the experimental tations self-sustaining? If they will do that you are ready to get nto the game and compete with them?

Mr. CASHMAN. I would not consider it quite fair competition; we lo not care to compete with the Government; but we can compete nd we can make a living; but if you continue your station there nd continue to give away your stuff to whoever wants it, it can have ut one result, and that is to destroy us.

Mr. STEELE. The point I wanted to make was that if the experinent station had no appropriation at all you would be willing to go nto competition with it?

Mr. CASHMAN. We are perfectly willing that you appropriate sufficient that these men may bring out new varieties.

Mr. STEELE. You mean to demonstrate. I understand.

Mr. CASHMAN. Yes, sir. And try to introduce something better to ake the place of what we now have. The box elder is filled with vernin, as the Congressman a while ago said. It is the best we have got o-day except the ash. It is their mission to give us something better han the box elder, not to raise the miserable box elder and send them ut free and compete with us. If it is a fact that these farmers are o poverty-stricken and in need of charity, why does not the Governnent say to the various nurseries in that territory, "We will give ou a fair wholesale price for a million ash." Give the nurserymen chance to live and protect their business, but you do not do that. You enter into competition with us and you deliver the stuff free of harge, which can not help but destroy our business, as it has done in Canada.

This windbreak stock is easy to propagate. We do not make any great profit, but the volume is such that we can get along very well. It is true that country is settling up rapidly, and there is going to be a splendid field if you do not take it away from us. If you take it away from us, I do not see much chance for us.

I could talk all day on this, but it is not necessary. I find that the coming spring that they have got 770,140 trees available, and they are going to take care of customers to the extent of 695,000. Now, in that list is 195,000 willow cuttings and 240,000 poplar cuttings. In the name of common sense, and I say to you, Mr. Taylor, do not those men know any better than to put cuttings in the hands of these farmers living in that dry-land area, where there is no possible chance of success and where it can not mean anything but discouragement in the planting of trees? The rainfall out in that section is only an average of 18 inches a year. You can not raise a cutting out in that section except through intense cultivation such as the farmer will not give it. Your boys will give it at Mandan and make those trees root and grow. The farmer may do it where he has got an irrigation plant. He might do it last summer when it rained nearly every other day, but you can not make a cutting grow west of the one hundredth meridian with the attention which the farmer gives to it, and the fellow that starts that sort of a thing does not know

the first thing about what he is doing. When it comes to experimenting, I presume it is experiments with the boys at the station. They do not know and would like to have the experiment tested, but it is no experiment with us. It is no experiment with Mr. Farmer; he has tried it and failed. Therefore we do not send out cuttings in this country. Even in our country we do not expect more than 60 per cent to grow, and under intense cultivation, under careful management and the very best of care, and what can you expect in that semiarid district?

Mr. HAUGEN. Do you question the authority of the department to do this work?

Mr. CASHMAN. I do. I do not see where they get the authority. They have no authority, as I see it. It was not the intent of the men who launched this thing to drive anybody out of business or to furnish anybody trees free of charge. If you are going to do that, gentlemen, why do you not furnish the farmers out there with binders and mowers, a few bulls, and other useful articles?

Mr. MCLAUGHLIN. Mr. Chairman, now that we have heard Mr. Cashman, I think it only proper that Dr. Taylor should have opportunity to present his views on this matter.

The CHAIRMAN. Dr. Taylor, do you care to present any statement along this line?

STATEMENT OF DR. WILLIAM A. TAYLOR, CHIEF OF THE BUREAU OF PLANT INDUSTRY.

Dr. TAYLOR. The matter was discussed in considerable detail in the hearing on the fifth day of the Plant Industry discussion, and I would merely like to ask one question, which is necessary to throw some light upon what the work is, and that is this: I would like to ask Mr. Cashman what the explanation is of the almost entire absence of shelter belts in that northern Great Plains territory as the result of the operation of the nurserymen and the farmers up to this present time?

Mr. CASHMAN. Have you been out there, Mr. Taylor?

Dr. TAYLOR. Not within the last four months.

Mr. CASHMAN. Have you looked that country over? You say there are no shelter belts out there?

Dr. TAYLOR. I do not say there are no shelter belts, but I would like to say this, that when the department undertook to carry out the will of Congress, as expressed in the clause that has been cited, this was found to be the case, as was stated in the hearing the other day, that the essential to placing with the farmer of improved plant material, whether fruit or other, was a suitable place on the farm in which to plant it—where it should have a fair chance in the climate. After careful consideration of the matter, it was concluded that the shelter belt was the essential, and the experience north of the international boundary was drawn upon and to an extent has been utilized in the drafting of the plan. The shelter-belt work, therefore, represents a cooperative effort of the department with the farmer to make available on the farm the condition that is required to insure a fair test of the types of new material that Mr.

ashman has referred to. The production of such new plant ma- rial constitutes by far the larger part of the work. I think that all that I care to say now, as the time is short, but I would like request of the committee that circulars and the papers that have en quoted by Mr. Cashman be included in the record practically in ll, as I think they are self-explanatory, and also to furnish a ncrete statement covering the matter.

The CHAIRMAN. Without objection, that will be done.

(The statement and circulars referred to are as follows:)

STATEMENT CONCERNING COOPERATIVE SHELTER-BELT PLANTINGS IN THE NORTHERN GREAT PLAINS.

There are probably few, if any, lines of work that have been taken up by he Department of Agriculture that have received as long and careful con- ideration both by Congress and by the Department of Agriculture before being ut into operation as has the cooperative shelter-belt planting in the northern reat Plains. The people resident in the northern Great Plains, who are itally interested in the agricultural development of that region, have long ecognized that the establishment of shelter belts around the farmsteads is ssential to home building in that region. They realize that there can never e a permanent and profitable agriculture there until the farmers are able to stablish comfortable and attractive farm homes. In order to accomplish this t will be necessary to establish shelter belts of hardy trees around the farm- teads. When these have attained sufficient size to afford some protection from he high winds that sweep across the open prairies it will undoubtedly be ossible to develop the growing of hardy trees, fruits, small fruits, berries, arden vegetables, and ornamental trees, shrubs, and flowers to a much greater xtent than is now being done or is deemed possible by many of the settlers ow in the region.

This conviction on the part of the people of this region eventually found xpression in Senate bill No. 222, Sixty-second Congress, first session—"A bill o establish an agricultural plant, shrub, fruit, and ornamental tree, berry, and egetable station at or near the city of Mandan, west of the Missouri River, in the State of North Dakota." This bill was introduced in the Senate by Senator McCumber on April 6, 1911. It provided for the purchase of a suitable site, the necessary farming land, and for the erection of buildings and other improvements to adapt such a site to the purpose of making an experimental farm, to demonstrate the kind and character of plants, shrubs, and trees best adapted to the climate and soil of the semiarid lands of the United States, and for the purchase of necessary stock and machinery, and carried an appro- priation of $100,000, or so much thereof as might be necessary, for this purpose. This bill was the subject of much discussion in the Agricultural Committee and upon the floor of the Senate and of the exchange of numerous letters and memoranda between Congress and the Department of Agriculture.

On April 3, 1912, this bill was reported to the Senate with amendments. These amendments consisted of a slight change in phraseology so that the title of the bill read as follows:

"A bill to establish an agricultural plant, shrub, fruit, and ornamental tree, berry, and vegetable experimental station, at or near the city of Mandan, west of the Missouri River, in the State of North Dakota."

The bill in this amended form passed the Senate April 15, 1912.

On May 2, 1912, an amendment "Intended to be proposed by Mr. McCumber to the bill (H. R. 18960) making appropriations for the Department of Agri- culture for the fiscal year ending June 30, 1913," was introduced in the Senate. This amendment followed the exact wording of the amended bill as passed by the Senate on April 15. The bill (H. R. 18960) reported to the Senate by the conferees on May 30, 1912, contained a separate item identical with that contained in the amendment introduced May 2, 1912, with the exception that the words "at or near the city of Mandan," which were contained in the amendment, were omitted, and that the words "berry and vegetable," which did not occur in the amendment, were inserted, and that the words "one hun- dred thousand dollars," which occurred in the amendment, were changed to the words "fifty thousand dollars" in the bill.

When the appropriation bill (H. R. 18960) came up for final passage on August 10, 1912, the paragraph which had occurred in the bill as reported by the conferees on May 30, had been merged with the item "For the investigation and improvement of methods of crop production under semiarid and dry-land conditions," by increasing that item to the extent of $50,000 and the addition of the following provision: "*Provided, however,* That the sum of $50,000 of this amount, or so much thereof as may be necessary, shall be used for the purchase of land and equipment and the construction of buildings necessary to establish, equip, and maintain an experimental farm in the northern section of the Great Plains area, to demonstrate the kind and character of plants, shrubs, trees, berries, and vegetables best adapted to the climate and soil of the semiarid lands of the United States."

This appropriation act was approved August 10, 1912, and immediate steps were taken to establish the Northern Great Plains Field Station, which was located near Mandan, N. Dak. The location of this station and the development and organization of its work was placed in the hands of a committee of experts in the Department of Agriculture, the members of which were especially well qualified by thorough scientific training and long, practical experience in the various lines of work to be carried on at the station. They also sent a delegation to the Dominion Experiment Station for southern Saskatchewan, located at Indian Head, Saskatchewan, where closely similar problems have been under investigation for some years. Mr. Malcolm Ross, the superintendent of that station, gave them very full and detailed information concerning the work at that station, which has been of great value and assistance in the developing of the work at the Northern Great Plains Field Station. A portion of this information was embodied in a detailed report submitted to the office of Dry-Land Agriculture by Messrs. Peterson and Pfaender. This report is too voluminous to quote in full, but the following brief extracts should be of interest to the committee:

"During the past season (1914) between four and five million trees and cuttings were sent out from the Indian Head forestry farm. The entire allotment for the work at this station is $48,000. This includes not only the cost of maintenance and distribution, but also that of inspection. Mr. Ross, the superintendent of this station, states that he considers the inspection the whole secret of their success. A total of approximately 28,000,000 trees have been sent out since the station was established in 1902. Mr. Ross stated that at least 80 per cent of the trees distributed are growing. During the first winter, after provision had been made for the work, the superintendent spent most of his time addressing farmers' institutes and other gatherings of farmers at schoolhouses, etc., trying to interest them in the shelter-belt work; as a result of this effort, 11 farmers were finally induced to plant trees. The second year 100 applications were received. Since that time the work has advertised itself. * * * Mr. Ross stated they had had some opposition on the part of short-sighted nurserymen. In his opinion, the nurserymen would be foolish to do otherwise than to support similar work in this country. He believes that, as a result of their work, the demand for miscellaneous nursery stock, such as ornamental trees, small fruits, etc., has been increased tenfold. * * * Deciduous seedlings were produced at an average cost of 40 cents per thousand, and evergreens at $1 per hundred. The entire cost of growing, overhead expenses, distribution, and inspection work for two or three years after planting averages about 1 cent for each tree planted."

As a result of careful consideration of all available information, the committee of experts in the Bureau of Plant Industry having this matter in charge decided, in August, 1914, that the most practical way to proceed would be to induce farmers to cooperate with the department in the effort, selecting for this purpose such as were suitably situated to carry on work of this character and willing to devote the necessary land, labor, fencing, and other features incidental to it. As the expenditure by the farmers upon this work would of necessity be much greater than the value of the young trees required for the tests, it was decided that the department should furnish the trees under properly arranged cooperative agreements by the farmers to observe the department's requirements for the preparation of the land and the planting and care of the trees, including their protection against damage by fire and live stock. In view of the almost universal failure of previous efforts to establish shelter belts of this character on the upland prairies of the region, it is believed that some such continuing arrangement for advisory supervision of

ese plats by experts is essential to the success of the work. Growing tests d demonstrations on farms appear to be essential to the effective prosecution the work in a way that will accomplish the purpose for which the Northern eat Plains Field Station was instituted.

The general plan of work, as outlined above, is believed to be fundamentally und, practical, and effective, and in harmony with the intent of the appropri-ion act under which it is prosecuted.

Those in charge of the work are convinced that the development of shelter its on farmsteads must be accomplished before much planting of fruit trees, rubs, vines, or other perennials can be successfully done in the region, and at if this is accomplished there will result a greatly increased interest in the anting of fruit trees, vines, and ornamental plants, such as are obtainable from mmercial nurseries, the planting of which by the farmer is now practically it of the question.

Nothing in the nature of a general or indiscriminate distribution of trees is been contemplated by the department. Only trees of known hardiness are nt out. The work is not designed to test the hardiness of these species. That determined in advance of any plan for their distribution. No reliable in-rmation is now available upon such vital questions as the proper grouping these species to make the most effective shelter belt; the proper spacing, th within the rows and between the rows, in order to meet the trying con-tions that exist within this territory; or the size and kind of shelter belt at is most effective. Within the very extensive area of territory covered by is work there is a wide range of both soil and climatic conditions. These estions can only be determined by actual experimentation. It is true that edlings and cuttings are sent out in lots of about a thousand rather than in ch small lots as would be sufficient to test the hardiness of them. As stated ove, the test of hardiness is not the essential point in this work. In order to ake a shelter-belt test a complete shelter belt is planted.

The average number of trees supplied each cooperator is somewhat less an a thousand. As has been shown in the record, the 732 applicants who will supplied this year amount to only one planting to above 200 square miles of rritory affected. It is obvious that this amount of experimentation can not stroy the nursery business within this area. The department contemplates plans or policies that in its judgment would have this effect. It is the tent to keep this work within certain carefully defined limits, carrying it o further than is necessary to provide the desired information. It is not a ee distribution of "all the trees that all the farmers want." It is true, as tated in the circular, that all farmers within the territory may apply for rees. It will be observed, however, that there is no statement that all applica-ions will be granted. In the first place, there are limitations set as to the umber that will in the future be accepted in any district or county. Second, he inspectors, instead of being "really nothing but salesmen out hustling ree orders" or "out getting the farmer to order free trees," are out for the urpose of sifting out from the applicants the few with whom the department vill enter into cooperation.

The station is caring for plant-breeding work, the creation of new and im-roved varieties, and the introduction and testing out of foreign varieties in n effective way. The shelter-belt work, which constitutes perhaps one-fourth he total activities of the station, is not allowed in any way to interfere with he creative work; it is considered, as has been stated, a somewhat necessary reliminary to such trial of new introductions or creations as may come rom this work. The statement that there are 40,000 apple trees grown at the Mandan station that are hardy in the North is erroneous. A few hundred have been raised in grafting experiments. This work is completed, and these are ntended for planting purposes on other stations of the department. A number f thousands of seedlings will be grown in attempts to originate varieties adapted o conditions that obtain in that section. They will not, however, be material or distribution.

The experience of the Dominion Experiment Station for southern Saskatche-an, at Indian Head, has been of great service in formulating the plans for operative shelter-belt development at the Northern Great Plains Field Station, nd many of their methods have been adopted in a modified form. Neverthe-ss, the work that the department is undertaking is very different both in tent and in its possible effects from the work done by the Canadian Govern-ent. While the department is undertaking only to put out as many plantings are necessary for experimental work, the Canadian Government is carrying

on a campaign, under which they are attempting to put out as many trees each year as possible.

The accompanying circulars will give a clear idea of the methods pursued in securing cooperation with the farmers. No. 1 is a copy of the letter which was sent to newspapers by the Northern Great Plains Field Station on October 12, 1914. This letter was accompanied by No. 2, the publicity circular. The attention of the department having been called to the fact that the publicity circular had been misconstrued by some people to indicate that it was the plan of the Northern Great Plains Field Station to enter into a general free distribution of trees, another circular was sent out to the newspapers on December 24, 1914. No. 3 is a copy of the letter which accompanied this circular, and No. 4 is a copy of the circular itself. Both of these circulars received wide publicity through the newspapers in the northern Great Plains, and their publication constituted the only method that has been used to notify the public of the cooperative shelter belt planting or to encourage or induce farmers to make application for such cooperative work. Circulars Nos. 5 to 9, inclusive, are those used to give information to the farmers who wrote to the station in answer to the two publicity circulars published on October 12 and December 24, 1914, respectively. An examination of these circulars in connection with the above statements, it is believed, will give a clear idea of the general plan of the cooperative shelter belt work.

The circulars Nos. 5 to 9, inclusive, copies of which are submitted herewith, are those now in use. They have been somewhat amended from the forms first used, but these amendments have not materially affected the plans of the cooperative shelter belt development as originally proposed and now practiced.

No. 1.—Copy of Letter Sent to Newspapers.

MANDAN, N. DAK., *October 12, 1914.*

DEAR SIRS: The inclosed publicity circular regarding the assistance which the United States Department of Agriculture, through the Northern Great Plains Field Station, Mandan, N. Dak., will give to settlers in establishing shelter belts about their farmsteads should prove of interest to your subscribers.

Since this circular is of purely public interest, I trust that you will feel free to publish it without charge. We would be pleased to receive a copy of the paper containing the publication.

Very truly, yours,

W. A. P., *Superintendent.*

No. 2.—Copy of Publicity Circular Sent to Newspapers October 12, 1914.

PUBLICITY CIRCULAR.

In accordance with an act of Congress, dated August 10, 1912, which provided for the establishment of the Northern Great Plains Field Station, this station will assist in encouraging shelter-belt development, free of charge to farmers, in the northern Great Plains area, comprising North and South Dakota west of the one hundredth meridian, and Montana and Wyoming, east of the 5,000-foot contour line. Trees will be available for planting in the spring of 1915, but application for these trees must be received prior to April 1, 1915.

The purpose of this cooperative shelter-belt development is to encourage the growing of windbreaks on the prairies of the northern portion of the Great Plains.

A circular has been prepared which states the conditions governing the cooperation. In brief, the Government will have the tract, which it is desired to plant, examined by an inspector who will prepare a planting plan. A sufficient number of hardy suitable trees will be furnished, the applicant free of cost, except express charges, to plant a shelter belt, or belts not less than one-half mile. The applicant must agree to prepare this land, according to instructions, during the year preceding planting and to properly plant and take care of the trees, giving them clean cultivation for two years at least, and preventing injury by fire or live stock by means of firebreaks and fencing where necessary.

For the 1916 planting, preference will be given to applicants from sections having five or more applicants. The purpose of this ruling is to keep down the expenses of inspection during the first year. Single applications that are received from isolated districts which can not be visited economically the first year will be filed and filled from the following year's supply.

All farmers who are desirous of cooperating in shelter-belt development should write to Mr. W. A. Peterson, superintendent Northern Great Plains Field Station, Mandan, N. Dak., for tree-planting circulars and application blanks.

No. 3.—Copy of Letter Sent to Newspapers.

MANDAN, N. DAK., *December 24, 1914.*

DEAR SIRS: You may recall that we recently sent you a publicity circular regarding the cooperative shelter-belt development work which is being undertaken by this station. To correct a misunderstanding which has arisen concerning the scope and purpose of this work, we would be pleased if you would publish, without charge, the inclosed press notice.

Very truly, yours,

W. A. P., *Superintendent.*

NOTE.—These two circulars (Nos. 2 and 4) are the only publicity notices that have issued, and they constitute the only method that has been used to call the attention of the general public to the cooperative shelter-belt planting.

No. 4.—Copy of Press Notice Sent to Newspapers December 24, 1914.

PRESS NOTICE FOR NEWSPAPERS IN NORTH AND SOUTH DAKOTA, MONTANA, AND WYOMING.

Information has reached the Department of Agriculture that some misunderstanding of the scope and purpose of the cooperative shelter-belt development work recently undertaken in connection with the Northern Great Plains Field Station at Mandan, N. Dak., appears to have resulted from an announcement recently issued by the department regarding that work. That announcement has evidently been understood by some to mean that a general free distribution of plant and tree material from the Mandan field station was contemplated. This is not the case. On the contrary, the number of farmers with whom the department can cooperate in this work will necessarily be limited, both by the number of seedlings available and the ability of applicants to meet the department requirements regarding the character and preparation of the land and the planting, cultivation, care, and continued protection of the trees against damage by live stock or fire.

No general or indiscriminate distribution of trees from the field station at Mandan is contemplated, nor will material there be available for use on town or village lots or on farms outside of the northern Great Plains area, which includes North and South Dakota west of the one hundredth meridian and Montana and Wyoming east of the 5,000-foot elevation above sea level.

No. 5.—Circular Sent to Farmers in Response to Inquiries for Information Concerning the Cooperative Shelter-Belt Planting.

UNITED STATES DEPARTMENT OF AGRICULTURE—BUREAU OF PLANT INDUSTRY—OFFICE OF DRY LAND AGRICULTURE—COOPERATIVE SHELTER-BELT PLANTING IN THE NORTHERN GREAT PLAINS.

INTRODUCTION.

The agricultural appropriation act for 1913 provided for the establishment of an experimental field station in the northern Great Plains for the demonstration of the kind and character of trees, shrubs, and other plants best adapted to the climate and soil of the semiarid lands of the United States. The station was located at Mandan, N. Dak. In the development of one line of its work the station is undertaking to cooperate with a number of farmers

in the northern Great Plains area, showing the feasibility of planting shelter belts on these farms. The object of this work is to stimulate interest in the planting of shelter belts and in this way to assist the farmer in improving the home surroundings.

Under the restrictions outlined in this circular the Department of Agriculture will furnish the tree and plant material necessary for planting the demonstration shelter belt without charge, except that the cooperator will be required to pay express charges on the trees from Mandan, N. Dak., furnish all labor required in preparing the ground, planting and cultivating the trees, and provide necessary protection against injury from stock or fire.

Farmers wishing to cooperate in the planting of shelter belts should make application on the regular form for this purpose, copy of which accompanies this circular, or which may be obtained by addressing the Northern Great Plains Field Station, Mandan, N. Dak.

Before filling out an application blank the contents of this circular should be carefully read to avoid all possibility of misunderstanding the conditions under which a cooperative shelter-belt planting is made.

TERRITORY COVERED.

The territory covered by this work is that part of North and South Dakota lying west of the one hundredth meridian, and of Montana and Wyoming which lies east of the 5,000-foot elevation. This will be understood to include the following counties: In North Dakota, Bottineau, McHenry, Sheridan, Burleigh, Emmons, and all counties west; in South Dakota, Campbell, Walworth, Potter, Sully, Hughes, Lyman, Tripp, and all counties west; in Montana, Teton, Lewis and Clark, Meagher, Park, and all counties east; in Wyoming, Sheridan, Johnson, Natrona, Carbon, and all counties east.

WHO MAY COOPERATE.

1. Any person owning or homesteading a farm operated under dry-land conditions within the area above described is entitled to make application for a cooperative shelter-belt planting, provided such owner resides on such farm.

2. Any public school, either in town or in the country, may apply for a shelter-belt planting, provided that such schools have sufficient land of suitable type.

Applications for schools should be signed by a member of the school board, who will be responsible for the planting and care of the trees.

No trees will be furnished for planting on land that is irrigated, or likely to be irrigated, as this work is limited to the growing of trees under dry-land conditions.

No trees will be furnished for planting on town or village lots.

LOCATION AND SIZE OF SHELTER BELTS.

It is highly important that the shelter belt be properly located with reference to the principal yards and buildings. In no case should the trees be closer than 100 feet to the house or barn. An exception to this rule will be made where roads, boundary lines, or the lay of the land will not allow this much space. Where the shelter belt is closer than 100 feet, there will always be danger of snow drifting against the buildings or in the dooryards. The trees may be planted as far back as 200 or even 300 feet and still be close enough to afford shelter.

The shelter belt should be laid out so as to afford protection from the prevailing winter winds. Usually it should be made up of two strips in the shape of a right angle on the north and west (or south and west). In some cases it may be advisable to plant on three sides, but it is not desirable to entirely inclose the farmstead with trees.

The shelter belt should be laid out in a strip of uniform width. Irregular pieces do not make satisfactory plantations.

Inasmuch as a wide belt is more effective than a narrow one, a strip from 40 to 100 feet in width and ordinarily 300 to 500 feet in length on each side should be laid out.

On account of the time and labor involved in planting trees, it is not considered advisable to plant more than 1 acre of ground at one time. The size of the planting will vary from one-half an acre to 2 acres, and where the total

eeds 1 acre only half of the ground should be prepared for planting
year.
ter belt on the north and west of the farmstead 80 feet wide and 400
; on each side contains about an acre and a half. Trees for only one
shelter belt of this size will be furnished to cooperators in one year.

INSPECTION.

g the summer before the trees are to be set out the department will send
ctor to visit the farm on which the proposed plantation is to be made
purpose of seeing that the farmer clearly understands the plan to be
. The inspector will determine whether the shelter belt has been well
is of correct shape and size, and whether the ground has been properly
for planting. If in his opinion the conditions are favorable, he will
irawing showing the location, shape, and size of the proposed planting.
e inspector's map a detailed plan will be made showing the number of
e kind of trees to be planted in each row, and the spacing distance. A
this plan will be sent to the farmer. The kinds of trees and the num-
furnished will be in accordance with this plan.
inspector finds the conditions unfavorable for planting the following
ıe will tell the farmer what necessary preparation should be made and
ostpone the application to some future date or cancel it as the applicant
t.
eptional cases where it will not be possible for an inspector to visit the
t, the necessary information will be secured by mail.
ollowing points may make it necessary to postpone or to cancel an
ion:
he preparation of the land does not meet the requirements outlined in
ular.
he shelter belt is not located so as to give protection to the yards or
s from the prevailing winter winds.
he land prepared is not of sufficient length or width to make a suitable
.
he location is obviously unsuitable for the growth of trees.
he location is closer than 100 feet to the house or barn.

KINDS OF TREES.

rincipal trees used are box elder, ash, elm, poplar, and willow. Other
known hardiness may be used in certain plantations. The kinds of
ected for a shelter belt will be those believed to be best adapted to the
ıditions of soil and moisture.
ıe work described in this circular no fruit trees, evergreens, or orna-
will be supplied.

SIZE OF TREES.

ock used will in most cases be as follows:
lders, 1-year old seedlings, 6 to 18 inches in height.
ash, 2-year old seedlings, 8 to 18 inches.
s and willows, either unrooted cuttings or 1-year old rooted cuttings;
r will range from 2 to 4 feet but will be cut back to about 8 inches. Un-
uttings will be furnished only when the available rooted stock is insuffi-

and other trees, 1 or 2 year old seedlings, 8 to 24 inches.
eptionally dry years the trees will be smaller than in normal years.
trees are used exclusively, as they are most certain to grow when
nted. If a tree is allowed to become too large before it is dug it is
le to get all of the roots. When such a tree is transplanted, unless
ches are cut back, the demand of the large top for moisture is often far
s of that which the remaining roots are able to supply. This condition
n very slow growth the first year and often in the death of the tree.
small tree, however, practically the entire root system can be taken up.
lvantages of using small trees are the saving of labor in planting and
ction of express charges.

PREPARATION OF THE LAND.

[illegible] Department of Agriculture to add to the series of [illegible] rules except such as it is believed [illegible] Under dry farming conditions trees [illegible] when they are planted in moist soil free from [illegible] vegetation except the trees.

[illegible] be best obtained by observance of the [illegible] any farmer who complies [illegible] interest in the work to warrant [illegible] cooperation with him:

1. [illegible] summer fallowed the year before the trees are [illegible] a seed bed as moist as could be obtained by any [illegible] material, such as stubble and weeds [illegible] from the tree roots; and by cleaning [illegible] labor of cultivation after the trees are planted.

2. [illegible] soil at least two years before the [illegible] long enough time this length of time is necessary [illegible] for trees and to kill out the native [illegible] after the trees are planted and begin [illegible]

3. [illegible] a good depth. This makes it easier to set the [illegible] the work being better done.

4. [illegible] summer fallow is impracticable the above [illegible] Specific instructions for preparing [illegible]

SPACING DISTANCES.

[illegible] and narrow belts for the purpose [illegible] comparatively close spacing will be the rule. The [illegible] 4 by 8 feet. Close spacing makes clean cultivation [illegible] shortens the period of cultivation. Under [illegible] the great danger to a plantation of trees is in the intrusion [illegible] the sooner the trees grow together and shade the [illegible] is passed.

[illegible] that the height of the shelter belt [illegible] than when the trees are spaced farther apart.

CULTIVATION OF TREES.

After [illegible] they must be kept well cultivated and free from [illegible] enough to shade the ground completely. [illegible] that cultivation should be discontinued [illegible] the most delicate of young trees, and if [illegible] eventually stunt their growth and eventually destroy the [illegible] when once started are very hard [illegible] safe method to follow is to keep the [illegible] To insure proper cultivation the farmer should [illegible] cultivator.

HOW TO MAKE APPLICATION.

If after carefully reading this circular a farmer wishes to make an application for trees he should first determine whether or not his farm [illegible] to which the work is limited, described in the first [illegible] He should then carefully fill in all the spaces on the application form, a copy of which is inclosed, and mail it to the Northern Great Plains Field Station, Mandan, N. Dak. An additional copy of the application blank will be supplied if requested.

Applications must be sent in before April 1 of the year previous to the [illegible] plantings are to be made. For example, an application for trees to be sent out in the spring of 1917 must be received on or before April 1, 1916. If the application is received after this date the trees can not be furnished until 1918.

quantity of stock which will be produced is limited it will be neces-
case the applications of any one year exceed the quantity of stock
to limit the number of cooperators accepted in any one locality or
tity of stock furnished for any cooperative planting.
ed:

WM. A. TAYLOR,
Chief of Bureau.

BER 18, 1915.

APPLICATION FOR A COOPERATIVE SHELTER-BELT PLANTATION TO THE
STATES DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY—
ERN GREAT PLAINS FIELD STATION, MANDAN, N. DAK.

---

e_____, County_____, State_____
office_____, State_____

LOCATION OF PROPOSED PLANTING.

___Qr. sec. _____, Twp. _____, Range_____
undersigned, do hereby make application for a cooperative shelter-belt
n to be made on my farm described above, and agree to locate the shel-
prepare the land, and plant and take care of the trees in accordance
regulations of the United States Department of Agriculture.
(Signature)_____
_____

No. 7.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
NORTHERN GREAT PLAINS FIELD STATION,
Mandan, N. Dak.

SIR: Your application for a cooperative shelter-belt plantation has been
and filed with the applications for planting material to be supplied in
g of ———.
ıame has been placed on the list of applicants to be visited during the
of ———.
conditions outlined in the inclosed leaflet have been fully complied with
pring of ———, such material as is then available will be supplied

ery truly, yours,

SUPERINTENDENT,
Northern Great Plains Field Station.

8.—COOPERATIVE SHELTER-BELT DEVELOPMENT—LAND PREPARATION INSTRUCTIONS.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF DRY-LAND AGRICULTURE,
Washington, D. C.

LOCATION OF THE SHELTER BELT.

not locate the shelter belt closer than 100 feet to the principal buildings.
ate the shelter belt on the north and west or south and west of the
t.
h part of the shelter belt should be from 40 to 100 feet wide and from
00 feet long.

[illegible] the same width for its entire length unless some [illegible]

[illegible] the trees of the second interfere, the shelter [illegible] 100 feet to the buildings. In such cases, how- [illegible] [illegible] [illegible]

The width shown on the plan includes 4 feet on each side, in addition to the space occupied by the trees, to allow for outside cultivation.

Where the shelter belt is made up of two or more strips which cross each other, forming corners, the trees in the corners should be checked.

In all plans north is at the top of the sheet.

CARE OF TREES WHEN RECEIVED.

Trees will be shipped the latter part of April or the first part of May. On the day that they are sent a notice will be mailed to the cooperator. Every possible effort should then be made to get the trees from the express office at once.

When taking the tress home they should be well covered with blankets to protect them from the wind and sun. On arriving at the farm the package should be opened in the barn or shed and the roots of the trees well moistened. Cuttings should be treated in the same manner. If the weather permits, the trees should be planted immediately. If it is not possible to plant at once, the trees should be "heeled in."

"*Heeling in.*"—Dig a trench 8 or 12 inches deep, with one side sloping, and preferably in some sheltered location. Open the bundles, keeping each variety separate, and place the roots in the trench, with the trees lying against the sloping side. Cover the roots well with moist soil, packing it firmly against them. If the soil is dry it should be moistened. It is not necessary to entirely cover the tops of the trees.

To "heel in" cuttings, completely bury them in moist soil, covering them 12 inches deep. It is not necessary to open the bundles.

PLANTING TREES.

Trees may be planted with either a spade or a walking plow.

Planting with a plow.—Set stakes in the row and at the ends and plow out a furrow in line with the stakes. Deepen it by plowing back in the same furrow. The bottom of the furrow should be from 8 to 12 inches below the level of the land surface, depending on the length of the roots of the trees. Carry the trees in a pail of water or carefully wrapped in a piece of wet burlap and plant by holding the tree by the top with the roots in the bottom of the furrow. Pull the soil in from both sides with the feet, tramping it solidly around the roots so that the tree will stand upright. Fill in the furrow with a shovel, hoe, or cultivator and level off the surface. After the surface is level the trees should stand about an inch deeper than they did in the nursery. In no case should the roots show above the ground nor should the trees be hilled up.

Do not plow more than one or two furrows at a time. If the furrow is left open too long the soil will become dry, a condition which is very injurious to the trees.

Planting with a spade.—A convenient way to locate the rows is by stretching a line. Small trees may be planted in the following manner: Thrust the spade straight into the ground and pry up the dirt in front of it; then, without lifting out the spade, push it forward and slip the tree in behind it. Spread the roots as much as possible and pull out the spade, allowing the loose dirt to fall back against the roots. Tramp the soil firmly about the roots.

Important points to be observed.—In planting be sure to keep the trees covered, or the roots in water, while planting. A few minutes of exposure to hot winds will usually kill small trees.

The best time to plant is on a quiet, cloudy, drizzly day. Do not plant on a hot windy day.

Plant the trees as soon as possible after receiving them.

Tramp the soil firmly about the trees.

PLANTING CUTTINGS.

The most important thing in planting a cutting is to tramp the soil firmly against it, especially at the bottom.

After the row has been marked make a slanting hole with a pointed hoe handle, broomstick, or stout iron rod. The holes should be about an inch less in depth than the length of the cutting.

Insert the cutting and tramp the soil firmly against it, taking care to pack the soil firmly against the lower end of the cutting.

Not more than one-half of the cutting should project above the level of the ground.

Always set the cutting with the buds pointing upward.

[illegible] the best method of planting cuttings. The method is the same as in planting small trees, except that the spade is pushed into the ground in a slanting position instead of straight down. Proper and improper methods of planting cuttings are shown in the accompanying figure.

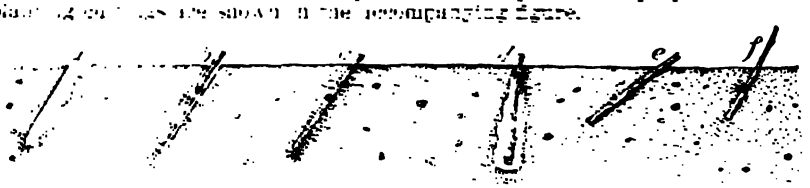

Fig. [illegible]. Shows the proper and improper methods of planting cuttings of tree Proper method: a, a hole made with a pointed stick; b, the cutting inserted and pr[illegible] position, the soil packed firmly again[illegible] the cutting remains moist; c, the soil packed firmly again[illegible] the cutting. Improper method: d, Soil not packed close about cutting; e, cuttin[illegible] planted too shallow, the cutting thereby too shallow. These improperly planted cuttin[illegible] are likely to dry out before rooting.

While planting keep the cuttings in a pail of water.

If the soil is dry, the cuttings should be watered after they are plante[illegible] Cuttings will not take root in dry soil.

CULTIVATION.

The trees should be cultivated immediately after they have been planted, as soon thereafter as possible. Do not wait for weeds to appear, but keep th[illegible] ground clean from the beginning. The cultivator alone will not be sufficient [illegible] keep out all grass and weeds. It will be necessary to go through the plantin[illegible] once or twice during the season with a hoe.

Success with trees can not be expected if cultivation is neglected.

It is important that a strip of at least 4 to 10 feet on the outside be kep[illegible] absolutely free from grass and weeds.

Wherever fireguards or fences are required, they should be provided by th[illegible] cooperator.

Approved:

WM. A. TAYLOR,
Chief of Bureau.

DECEMBER 20, 1913.

Mr. HAUGEN. Under what authority are you expending th[illegible] money?

Dr. TAYLOR. The identical authority under which practically eve[illegible] investigation that is made in the Agricultural Department has be[illegible] made under the organic act. The Department of Agriculture und[illegible] the organic act has the authority to cooperate with farmers in t[illegible] prosecution of such work as in its judgment it is necessary to car[illegible] out and which is authorized by Congress.

Mr. ANDERSON. Is he authorized to furnish the material, too?

Dr. TAYLOR. Exactly so. In every case, such as the breeding [illegible] grain, the breeding of cotton, the breeding of fruit, the introducti[illegible] of such material from foreign countries, the department sele[illegible] farmers who are so placed that they are in position effectively to [illegible] operate with the department in determining what can be done, a[illegible] under arrangements more or less formal (this is more formal th[illegible] most of the arrangements are) the department places with [illegible] farmer the material that it desires to have tested, in order to [illegible] termine what its value is.

ANDERSON. Does it give general advertising of the fact that it nish this plant material free of charge?
AYLOR. More or less general, depending upon the character particular things under consideration. I wish to be under- early that in principle this is fairly typical of the method eration with farmers that the department has found it ad- to adopt in connection with practically all its plant work.
McLAUGHLIN. Do you not go a little bit further in this than ther?
AYLOR. To this extent, that in this particular case we have that the farmer should set aside a piece of land which our uld personally examine and find suitable and that the farmer finitely agree to fence the property and in every way do necessary to carry it forward.
McLAUGHLIN. How many men are employed by you in this Do the hearings show?
AYLOR. Yes.
HAUGEN. The item in the bill says nothing about your appro- ?
AYLOR. Oh, no.
HAUGEN. Under what authority do you do this?
AYLOR. Under the organic act.
CHAIRMAN. You grow the trees at the station under the item in this bill?
AYLOR. Yes.
HAUGEN. And you hold that you have the right and the y under the organic act?
AYLOR. Yes, sir.
ASHMAN. I would like to ask Dr. Taylor if it is not a fact se young graduates, and those who are looking after their , not only in the States but in the National Government, are verything possible they can in order to build up a field for es to find positions for as many as possible of them?
AYLOR. It is not a fact.
ASHMAN. There is one other thing. Dr. Taylor makes the it that there are no trees growing out in that section. I say t is not true. I say that while it has been a hard country trees grow, yet the farmers who have taken the advice of erymen—the same kind of advice these men will give them— ers who have taken such advice, and have planted the trees good results. They do not grow as fast in that country e East where there is more rainfall, but they are growing; y are doing well. It is a new country; it is a tremendously untry. There are two-thirds of these people who have moved country within the last three or four years, and when you country as a whole, there are not many people, but con- the number of trees that have been planted, the percentage that are growing and doing well, and if we are allowed to business there will be 10 groves to the one that will be there olicy of the Government is carried out.
eupon, at 1.40 p. m., the committee took a recess until Thurs- bruary 10, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES.
COMMITTEE ON AGRICULTURE.
SENATE, January 17, 1912.

The committee met at 10 o'clock a. m. Hon. Asbury F. Lever [illegible]

The CHAIRMAN. Gentlemen, upon the order of the committee, we have [illegible] hearing to hear Mr. John W. Geraty, of South Carolina, [illegible] matter in connection with the item for [illegible] Board of Estimates. The item referred to will be found [illegible]

[illegible] have you a statement to the committee what you [illegible] of the item?

Mr. GERATY. Mr. Chairman and gentlemen, the item that I wish to discuss is for the purpose of getting an experimental distribution of our hardy open-air plants that are produced on the south Atlantic seaboard.

In our territory there, nature has given us a combination of conditions by which we can sow cabbage seed of any of the varieties during the months of October, November, December, January, February and March, and on account of the peculiar conditions existing there we can produce those plants in the open ground, the plants making a slow, hardy growth until about at the age of 10 or 12 weeks. During that time they are in practically a dormant condition and when in that condition they can be shipped to the territory farther north and they will withstand a temperature of 15° above zero, without injury. They will not be injured a particle. And that is a condition that is not generally known.

Take, for instance, Illinois, Indiana, Michigan, Wyoming, Iowa, or any of those other Northern States, just as soon in the spring as the land thaws out sufficiently to get the plant roots in the soil, a man can take those hardy plants and put them out—plant them. Now, he may have a dozen frosts and freezes, the land may freeze up four or five times, after those plants are transplanted, and they will not be injured and the root growth continues. As a result of that, just as soon as there is growing weather in the spring the established root growth assimilates the fertilizer in the soil. The plants grow very rapidly and will mature heads anywhere from two to six weeks earlier than they can be matured from plants of the same variety grown in hotbeds and cold frames.

t is the condition that exists on the south Atlantic seacoast. ıose there are 70 or 80 men who make a business of growing plants altogether, and we have five or six hundred market ıers who also sell plants—they sell the surplus left in their eds.

value of these plants is generally known to all the market ing sections, that is, the commercial cabbage growers all over untry, and although near large cities and towns we have been) get them introduced, we have not been able to do so in the ommunities.

ive you an illustration of how the demand for these plants has ed, about five years ago a produce commission merchant in elphia, Pa., who does a lot of business in South Carolina early bles requested that we send him 50 boxes of plants for distri- to the market gardeners at Moorestown, N. J.—that is a large t gardening section across from Philadelphia. We sent them es of 500 plants each for experimental purposes. The de- for these plants increased and last year we sold there four and million plants to the market gardeners at Moorestown, N. J. years ago a man who lived at New Haven, Conn., and who our section during the gunning season came to see us, and he ted us to send him a batch of plants for a market gardener at Haven. We did so, and the first season that market gardener s neighbor used 50,000 plants. Last year they used 480,000 is year they have already placed contracts with us for a million half.

same condition exists around Chicago, around Columbus, s, New York, Quebec, and Montreal. And in that way our have been introduced to practically all the market gardening ıs. But the people who can not be reached and whom we can ıost with these plants are the people living in the rural districts ho live in the little country districts and run little home gar- nd who have not access to the markets where they can buy arly vegetables. Take a man living out in a rural community, or 6 miles from the nearest market: if we can get that man n the value of these plants, he can set out fifty or a hundred in his garden and produce a cabbage for the consumption of nily from two to six weeks earlier than he can from his ants grown from seed. That would just mean that that man tting cabbage that much earlier in the spring, and it would a great reduction to him in the cost of living, because he would rly vegetables which he could not get otherwise because not ıough to the market to buy his green vegetables.

HELGESEN. You mean that he could eat cabbage when other- e could not.

GERATY. Yes, and he could eat them at a cost of one-fifth of a pound. Where you have to produce them in sections where ould have to expend $40 to $50 an acre for fertilizer, you can e cabbage at less than a cost of 1 cent a head. It takes an e of from ten to eleven thousand plants to set out an acre, y using $50 worth of fertilizing material, as we have to do South—the northern people do not use so much—you can e that cabbage at a total cost, including the cost of plant-

ing cultivation and harvesting, of $85 an acre, including the cost of [illegible]

[illegible] plants, and which we did not find out [illegible] though we have been in the [illegible] with the kraut people, where the largest [illegible] the Hahn Bros. Co. & Nettert, and the Heinz [illegible] Lewis and Leibhart & [illegible] at Newport, Tenn.—[illegible] early cabbage. And we [illegible] for instance, the kraut [illegible] States, when they have [illegible] maturing of his first [illegible] in the spring and the [illegible]. When those conditions [illegible] these plants can advance the [illegible] their kraut, and have it [illegible] cabbage from seed of their [illegible]

Mr. OVERMYER. [illegible] plants been introduced in northern Ohio?

Mr. GILBERT. [illegible] Ohio.

Mr. OVERMYER. Canton, Ohio, and Frenchort, Ohio, are large kraut-producing [illegible] they have large kraut factories at those towns.

Mr. GILBERT. Well, they could all use these plants out there to the same advantage as they are now used by Hahn Bros. Co., at Muscatine, Iowa, and the Heinz pickle people.

Mr. OVERMYER. Have you any publications that you could send those people?

Mr. GILBERT. Oh, yes.

Mr. OVERMYER. I would be glad to have you do so.

Mr. GILBERT. These plants have only been used by three of the kraut manufacturers so far, as we did not know until three years ago the advantage that they would be to kraut makers.

Mr. OVERMYER. I know that they have to have all their cabbage maturing at one time. That simply floods the market out there and they can not take care of it, and if the maturing period could be distributed over a longer time for the growing of their cabbage it would be quite a benefit.

Mr. GILBERT. As to the advantages of the use of these plants for the kraut people, we are shipping at the present time from five to eight carloads of these plants per day. It takes from 800,000 to 1,000,000 plants to load a car; that is, the refrigerator cars, because we ship all car lots of our plants in refrigerator cars.

Mr. WATSON. What plants are these?

Mr. GILBERT. The early cabbage plants which are grown on the South Atlantic seaboard. That business continues until the middle of March or the first part of May, and the kraut people found that by using these early plants in the early spring and then using their own plants later on they could fill their vats twice during the kraut season. Your cabbage matures sufficiently early so that they can [illegible] get it out and harvest it in time to put their own cabbage in the same vats. The cost of the vats is the biggest investment cost to the kraut manufacturers, and although we have

been in business, as I say, since 1868, we did not find out about this until three years ago and that was only by chance on account of the market gardeners at Muscatine, Iowa, buying their plants to produce an early crop of cabbage. One year when prices in the markets were very low, growers at Muscatine, Iowa, sold their cabbage grown from these plants to kraut people, who krauted same and had it out of the vats before the local crops came on.

And this thing about these plants withstanding a temperature of 10° above zero—and I have known where they have withstood temperature as low as 4 degrees and not been injured—we do not know to what it is due, and our Agricultural Department here never realized it, but my theory about it is—I do not know whether I am right or not—that it is due to the peculiar conditions that exist there on these sea islands. My reason for stating this is that we own land on the outlying islands and own farm lands back on the mainland, not over 5 miles distant, on a direct line from the seacoast. We can not produce enough cabbage plants on the mainland farm to set out our crop, and still we can go 5 miles away on these sea islands and grow these plants, carry them across the bay, and set them out on the other land and grow an early crop of cabbage.

Now, I believe that condition is due to the action of the salt spray. And I say that for this reason, that in sections where they have these overhead systems of irrigation, where they use them for frost protection, they turn on the water when they know they are going to have a cold night, which will endanger their vegetables, and a little mist will fall, and that will cover that vegetation, probably, with a coating of ice. And with the salt spray it is the same way. Now, I do not know the theory of it—this gentleman, here, probably can tell us—but the same condition exists on those outlying islands. We have a continuous surf there, and the atmosphere is filled with this sea water atomized. On a sunshiny day you can see the mist floating up from the beach, and in the early mornings our plants will just be covered with that water and moisture; and when it evaporates there is so much salt in that spray that the salt will crystallize on the foliage of the trees, plants, and everything we are growing there. I believe that salt has a curative, toughening effect in some way on these cabbage plants.

Now, here is the color that you will see these plants, if you would like to see them and compare them [exhibiting plants]. They get a reddish-brown or purple color, like that. The leaf of that plant is thick and heavy. It is three or four times the thickness of plants grown inland and away from the salt spray.

Mr. HELGESEN. What is the color of the cabbage?

Mr. GERATY. These are the regular types of cabbage.

Mr. HELGESEN. I mean, when it grows into a cabbage head, would t be green or like that?

Mr. GERATY. It would be green. This is a Charleston Wakefield ariety, and that is what we call the Early York, or Jersey Wakefield ype.

Mr. WILSON. Do you have to grow the red cabbage down your ay?

Mr. GERATY. We can grow it wherever we can get a market. It an be grown in competition with growers near all of the large iarkets.

... plants under the con- ... affect the type of the ...

... grow any type. For in- ... all over the country ... Peligiano, in Baltimore, ... we are growing cabbage ... an issue of something ... for instance, of the ... catalogue]. The ... H. G. Hastings & Co., ... at Shenandoah, Iowa; ... Stubbs Co., at Louisville, ... go generally to the ... all shipped direct from our ...

... in which these plants ... scribed?

... over about the ... as far as Wilmington, N. C., ... we sell the plants ... Brunswick, Ga. That ... if you go too far south the ... a sappy and tender growth, ... and northern sec- ... dormant. And if you ... won't get a plant ...

... before it gets into ... two little flat leaves and a stem about as big as a ... and if you have a heavy white frost under those conditions, or any freeze, a great many of those plants will all be lost. But under the conditions existing with us we have a climate there where we can get the plants over that critical stage, but if you go farther north, like Delaware, Maryland or New Jersey, to get a plant large enough to stand the winter you have to sow your seed so early in the fall that by the spring of the year when you set that plant out, the length of time from the sowing of the seed to the transplanting of the plant is too long. A plant of that kind will make a seed shoot instead of a head.

Now, we have been selling plants for years with a guarantee. Our guarantee is very broad. Last year we sold something over $150,000 worth of plants on this guarantee and made a refund of only $320.

Mr. HAWLEY. $150,000?

Mr. GERATY. Yes. And here is the way we sell them: We guarantee our plants will arrive in good condition, stand a temperature of 16° above zero, without injury, and produce satisfactory crop results. If the grower is dissatisfied after a trial of our plants, we will refund the price of the plants.

Mr. HAWLEY. What are those plants worth, wholesale?

Mr. GERATY. Our wholesale contract price to all the seed houses is 75 cents a thousand. They are packed in a paper box that holds from 250 to 1,000 and delivered to the transportation company or post office.

Mr. H[illegible]. Seventy-five cents a thousand?

Mr. GERATY. Seventy-five cents a thousand. And the retail price ell to the consuming trade runs from $2 down to 90 cents. Our e to the retail trade is—500 plants, at a cost of $1; 1,000 to 4,000, price is $1.50 per thousand; 5,000 to 8,000, the price is $1.25 housand; 10,000 to 50,000, the price is $1 per thousand; and over 00, the price is 90 cents a thousand. Of course, in our regular ibution to the seed trade, we make a price to the seed merchant will enable him to sell at the same price at which we retail, and ake a profit.

r. HAWLEY. If they take a large quantity, you sell at 75 cents?

r. GERATY. Yes. For instance, we sell to the Hahn people at nts, and the kraut people, who buy in carload lots, and we ship 1 in refrigerator cars.

r. WILSON. Where is your place of business—near Charleston?

r. GERATY. Fourteen miles from Charleston, in a direct line. is the largest market-gardening section on the Atlantic coast h of Norfolk, Va.

ıe CHAIRMAN. Your plan is to distribute these plants so that will get out into the rural communities?

r. GERATY. That is the plan.

ıe CHAIRMAN. So that they will reach the people who ordinarily ot see the advertising matter that is sent out?

r. GERATY. That is the proposition exactly. Here is a letter from ion, Ill. I do not know just where that is——

r. WILSON. I know very well.

r. GERATY. Last year, to get these plants introduced, we ran an rtisement in all of the agricultural papers printed in Canada and States north of the Ohio River and Pennsylvania, offering to give ckage of these plants for testing purposes, postage prepaid, pro- d the party would report the results produced after the season over. As a result of that, we got 72,000 replies, and we sent 00 packages of plants and have received something over 50,000 rts from the 72,000 people who used them. I just brought a few ıose replies along, and here is one from Marion, Ill. It says:

ır frost-proof cabbage plants has amazed and astonished my neighbor in early ıce, and they mature perfectly. Expect to send an order by December, if possible. are a godsend to home gardeners, also shippers, as I had cabbage when my ls who purchased plants from hothouses were paying 5 cents per pound of grocers. estly was delighted at results obtained. Publish if you wish, as I will answer all ng addressed envelope.

ıat is from Mrs. Minnie Kilgore, Marion, Ill.

ere is another one from the State of Illinois, from Wyoming, Ill. ys:

ceived the frost-proof cabbage plants, and for every plant I received a good head ıbage. Never had cabbage do better. Some of the heads weighed as high as 7 ls.

pect an order from us in the spring for more of your frost-proof cabbage plants.

ıat is from Mrs. George R. Watson, Wyoming, Ill. Now, that is ge cabbage of this type. All of those cabbage we sent out were ; we call the Wakefield variety, which is a small-pointed head matures early. The usual average is from 2 to 2½ pounds.

ere is one from William Kemper, at Casey, Ill. [reading]:

plants reached me in good condition and grew fine, making very large, nice . I believe a week earlier than my home-grown plants set at the same time.

Think I'll try setting your plants in the early spring instead of raising them i in boxes as I have done before. Thanking you for the plants, etc.

I have some of these letters from different States. Here is from the State of New York, from George M. Gillette, at Monti N. Y., [reading]:

I am a business man almost never eat cabbage; am no gardener but like the best vegetables and improvements in everything, so ordered your 50 free mail over the fence my next door neighbor, William Schroeder, who has been s for a few years. But last year discontinued the business for a ti back to cabbage.

I've tried to work kohl-by crude or otherwise. The rest were planted wh specimens were set out by mistake. They formed loose kid fine heads about three over the cabbage worm, or rather Pe Pe the plants, but were free from the cabbage worm. Brother Pe Pe the plants in cold weather but are n pe

Mr. Schroeder highly recommends your plants and through him I believe on ordered some. He is trying to secure a truck farm or garden, and when he c will need your plants in early April, will likely want some of them next year. glad to help you sell them along and to send you some good names of prospecti forms on opposite side of this sheet, and wishing you every success in the bu I am

Very truly yours

GEORGE M. GILLE

Here is one from Gloversville, N. Y., [reading]:

We were satisfied with the plants sent us and will order more next sprin early. Our soil here is quite late here. The cabbage was fully four weeks than our other kind. Fine heads.

Yours respectfully

EDWARD FIL

Here is one from Falconer, N. Y., [reading]:

The cabbage plants sent last April made fine heads and they were over a month than the plants I raised. I will send you the names of some of my neighbors w in the fall gardening. Thanking you for past favors, I am,

Yours truly

P. H. MANSFI

We have a number of letters from every State. Here is one from Canad Wapella, Saskatchewan, Canada. It says:

I have got the finest lot of cabbage plants, which I am pleased to t we have ever had. We had a hard frost after a heavy rain and the ice w stood on the ground. Everything I had up was frozen down, but the fro stood the frost and I was able to have them a month earlier than anybody else

Mr. WILSON. Have you sold any to any gardeners in and a

Mr. GERAGY. I sell a good many around Joliet. I do not just how close that is to Chicago.

Mr. WILSON. That is not far from Chicago.

Mr. GERAGY. You see, the gardners would hardly have the shipped to Chicago. It would probably be to stations right a there. I know I sell a lot to Joliet, Ill., and Rockford, Ill. A J. C. Vaughn Co. have tested our plants at Chicago.

Mr. WILSON. They have?

Mr. GERAGY. Oh, yes. That is the trouble about intrucing plants. Take it a few years ago; I sent an advertisement to one principal agricultural papers in the Central West, and the m turned that advertisement and said that in addition to being a paper editor he also ran a little farm for experimental purpose

ıade a study of farming, and he said that my advertisement g that those plants would stand a temperature of 10° above vithout injury, was so palpably a fraud that he refused to print lvertisement. Now, as a result of that, that man has done me good than anybody else. I sent him a sample package of the and told him I supposed he was open to conviction and was d to send him the plants for as severe a test as he wanted to and asked him to try them out. He did and the next year I got r from him and I have kept the first letter he wrote. The next ıe was glad to run that advertisement and to say that he had mistaken, and he not only published the first letter he had n me but also the results he had obtained afterwards. And he ne more to further the sale of the plants than almost anybody

WILSON. The reason I was asking about it, you know around go, in Cook County, there are a great many truck farmers who large quantities of cabbage; and I wondered if they had these market and, if they did not, I was sure there would be a very ield for them.

GERATY. Oh, yes, they have them there. We have had no le in reaching the truck gardeners; but the class of people we ying to reach now, and the people who will get the most benefit this, just as this woman states here, are the people who have little home gardens, the people who are in the same class as you are sending these packets of seed to. For instance, you a package of your vegetable seed out; the person with a little garden uses those seed and appreciates it, and he gets some s. But if a package of those seed goes to a market gardener, ver opens it; he throws it on the scrap pile. He has certain and types that he raises, and he is not going to use the seed nd him. And it is the same way with these plants with the t gardener who is raising an early crop of cabbage. And as ıstration of the way we introduced these plants, just take the ı around Louisville; that is one of the largest cabbage-raising in the central west, east of the Mississippi. I tried to sell cabbage plants to the market gardeners in that section for l years and could not do it. And at last I went to the Wood- s Co. and I said to Mr. Wood, "I want you to get in the machine ake me around to the most progressive cabbage growers in section, not necessarily to the largest ones, but the men you are making the biggest success with cabbage." And I went l to see those people. They all had hotbeds and cold frames l the equipment for growing plants and they did not want to a change. And I said to one man, "You have got 5 acres bage. I will supply you with enough plants to set out one f cabbage and I want you to set them out and grow them ling to my instructions." And I said, "What has been your ge profit per acre from your cabbage for so many years?" He ne that, and I said, "Here is what I will do; I will supply you he plants to set out an acre, and I will go down with you to ank you name and deposit an amount to cover the net profit ave been making out of your cabbage and after that acre of ge matures if you don't make as much profit off of that acre

as you do from the balance of the acreage grown during the same year, I will make up the difference."

As a result of that there are now about 20 market gardeners around that section now using my plants, and I am now distributing in Louisville in carload lots. Because if a market gardener puts his plants out there and puts his cabbage in the local market three weeks before the other fellow, then that other fellow has to use the plants whether he wants to or not. So it is pretty easy to introduce them in the market-gardening sections, but we do not have an opportunity for introducing them out in the rural sections, because the people do not take any publications, they do not read, and they do not get the advertising. And I do not know of any way of reaching them except that a Congressman knows the name of everybody who votes in his district, and we could do it in that way. And if you wil do that you will give a man something he appreciates and something he can not produce himself, and it gives the whole country the advantage of the peculiar conditions existing on our seacoast.

Mr. CANDLER. When a man gets the plants once, why can he not produce them afterwards himself according to your methods?

Mr. GERATY. Because he is not living on the south Atlantic seaboard. It is not anything in the seed; it is not a new variety of seed. These plants are produced from any kind of seed. It is just the conditions under which they are grown; we have no special kind of cabbage.

Mr. WILSON. They can not raise the plants themselves?

Mr. GERATY. No, sir. And, for instance, take Hahn Bros. Co. They have the most up-to-date equipment I have seen for market gardeners. All of their hotbeds are equipped with hot-water heating. And Mr. Hahn tells me he uses our plants because even with his investment in his equipment there he can buy our plants and lay them down in Muscatine, and not only gets a better plant then he can produce himself, but he gets it at a lower cost, because the upkeep and operating expenses of his hotbeds and heating plant are heavy. But our plants are grown right out in the open field and can be planted with a gang drill. This year we planted 420 acres of cabbage plants. And we are only one of 70 or 80 others.

Mr. STEELE. How many acres?

Mr. GERATY. Four hundred and twenty acres in cabbage plant seed beds.

Now, 10 years ago the total sale of these plants was less than 1,800,000 a year. Last year it was over 500,000,000 of them—shipped from an area of 5 or 6 miles—a radius of 5 or 6 miles of Youngs Island, S. C.

Mr. WILSON. It is quite an industry, then?

Mr. GERATY. It is quite an industry.

Mr. ANDERSON. Have these plants any trade name by which they are designated?

Mr. GERATY. Everybody advertises them as frost-proof cabbage plants—everybody in the business that I know of.

Mr. ANDERSON. Does that necessarily mean plants raised in the locality that you have mentioned?

Mr. GERATY. I think it does; yes, sir.

Mr. ANDERSON. What I was getting at was this: If the Agricultural Department should send this sort of plants out to people, they

would not know where they could get hold of them unless they would buy of the department. That, of course, would practically make it a proposition of the department advertising private business.

Mr. GERATY. You have a large territory; you have the whole south Atlantic seaboard there. They can get them anywhere in that territory. It looks to me like that would be giving the people of the country the advantage of a peculiar condition existing there and which they are entitled to.

Mr. ANDERSON. Well, I think that is true, or might be true, at least, providing these plants have some trade name which identifies them which would not be the subject of fraud in some way or other.

Mr. GERATY. Well, I think they have been tested out by the department. I think these plants have been tested out by every agricultural college—I know I have sent them to every agricultural demonstration farm in the United States. And we have had bulletins from a good many of the agricultural schools which they have gotten out on them—the Pennsylvania State College, Illinois, and others. We have had them tested and we have done all we can do as far as concerns the people you can reach easily.

Mr. HAWLEY. What is your proposal? You come before the committee to make what proposal?

Mr. GERATY. The proposal I would like to make would be this, sir: To get an experimental distribution that we take, say on page 87 of your estimates there, at the end of the paragraph——

The CHAIRMAN. That is the seed-distribution item, and this would be a proviso at the end of the seed-distribution item. I have discussed this with Mr. Geraty, and know what he has in mind.

Mr. GERATY. I would add this [reading]:

Provided, That of this amount $10,000 may be used in cooperation with private firms in the experimental distribution of frost proof cabbage plants grown on the Sea Islands of the South Atlantic coast.

Mr. WILSON. That is an amendment you want?

Mr. GERATY. Yes, sir.

Mr. JACOWAY. These plants will mature anywhere in the United States, won't they?

Mr. GERATY. What State are you from, sir?

Mr. JACOWAY. Arkansas.

Mr. GERATY. I have a report from there.

Mr. RUBEY. Don't they have to have soil in order to grow? [Laughter.]

Mr. WILSON. Yes; they would not grow on rocks, would they?

Mr. GERATY. They will grow in Arkansas, I can tell you that. In fact, I have been there.

Mr. JACOWAY. They would not grow in Missouri, would they?

Mr. GERATY. Yes, sir; they will grow in Missouri, too. Here is a letter I have from Arkansas [reading]:

M. C. GERATY CO.

DEAR SIRS: I received your request for information as to my trial of your frost-proof cabbage plants and find them very satisfactory. They were one month ahead of my home-grown plants grown in a hotbed.

Yours, respectfully, BUELL MAYFIELD, *Garfield, Ark.*

And here is one from Searcy, Ark. It says:

Received 50 early Charleston Wakefield cabbage plants from you and wish to say that they were headed before my early Jersey Wakefield from my own garden. I

have praised your cabbage plants to all my neighbors and friends everywhere and truly hope that you will have several orders to fill from them. Thanking you for past favors, I remain

Yours truly, Mrs. L. M. DAVIS.

Mr. ANDERSON. I do not think you need any help from the Government.

Mr. HELGESEN. Isn't North Dakota considered as a cold climate?

Mr. GERATY. I think it is generally considered as a cold climate.

The CHAIRMAN. Have you anything from North Dakota?

Mr. GERATY. Yes; I have them from North Dakota to Texas and from California to Virginia.

Mr. HELGESEN. I will tell you what we do now, we pay from 6 to 8 and 10 cents a pound for early cabbage out there.

The CHAIRMAN. What have you from North Dakota?

Mr. GERATY. This is from Mrs. Charles Burkett, Starkweather, N. Dak. [reading]:

In regard to your letter, I had cabbage to use by the first of August from the frost-proof cabbage plants you sent me.

Evidently this is a Swede, or something.

Mr. ANDERSON. That is North Dakota, then.

Mr. GERATY. I mean, he writes disconnectedly [reading]:

We had such a dry summer, but the cabbage done fine. It surely is frost proof, for the ground froze so hard one could hardly plow after I set them out, and it didn't hurt them at all, and your cabbage is five weeks earlier than the cabbage is that I have

Mr. JACOWAY. Do people in Chicago eat cabbage? Have you any record there for Chicago?

Mr. GERATY. I guess they do, sir. This is from Towner, N. Dak.

Mr. HELGESEN. They are both farming districts.

Mr. GERATY (reading):

DEAR SIR. Take great pleasure in being able to give you a very favorable report of the plants received from you last spring. Although it has been a very unfavorable season, with heavy frost every month and less than 3 inches of rain in six months, we had cabbages for table use August 8 and have several fine heads yet, and do not know of another head in town. Lost several plants by cutworms. Will get our order sure.

Mr. STELLE. I move that be stricken from the record for the fact that it is not a good advertisement for North Dakota. [Laughter.]

Mr. GERATY. Here is one from Sykeston. It says:

The frost-proof cabbage plants we received from you all grew and are nicely headed. Every one who has seen them says they are the nicest they have seen this year. We expect to get a larger bunch of them in the spring, as there is no comparison with our home-grown plants.

Mr. CANDLER. Have you any from Mississippi?

Mr. GERATY. Yes, sir.

Mr. CANDLER. From down in the valley of Oktibbeha?

Mr. GERATY. I do not know whether from that valley or not.

Mr. CANDLER. If you haven't tried them down there, then you haven't gotten the best results yet.

Mr. GERATY. I got a letter last year from a man in Alaska sending an order for these cabbage plants, with instructions to be sure to get them off on a certain date, as they were having only two mails a [illegible] by dog sled, and if he didn't get them on that mail—and also he had gotten plants from me the year before and had

roduced and sold those cabbage at $2 a head when he made them, nd that was in Alaska.

Mr. YOUNG. Why don't you sell them down in Dallas?

Mr. GERATY. We sold over $5,000 worth in Dallas last year. They re one of my best customers.

Mr. YOUNG. I have bought these cabbages and planted them out ıyself

Mr. GERATY. Then I guess you know something about it.

Mr. HAUGEN. The department has authority now to do the very hing proposed by the gentleman, hasn't it?

Mr. GERATY. I suppose it has, hasn't it, Mr. Lever?

The CHAIRMAN. It may have the authority, but it has never exerised the authority so far.

Mr. HAUGEN. However, I wish to ask whether you have taken the ıatter up with the department; and if so, what does the department ay?

Mr. GERATY. I took it up with the department last year, and the epartment sent one of their men down to our place, and he took hotographs of the fields and got a sample batch of plants.

Mr. JACOWAY. What is the price of these plants?

Mr. HELGESEN. That is already in the record. Just let him read it.

Mr. GERATY. Here is a little photograph that was sent to me oluntarily, if you gentlemen would like to look at it. It speaks for self. It was sent to me by a fertilizing firm at Jackson, Miss. At ıat time the price of tobacco had gotten down and they wanted to ıake a change.

Mr. HAWLEY. You don't mean to say they are going to make gars out of them?

Mr. GERATY. No; I mean on account of the low price of tobacco, ıese people are going to discontinue planting tobacco and grow ıbbage. As a result of that, people we had never been able to get) grow our plants before, we sold our plants to the Lincoln County ruck Association and the Pea Ridge Truck Association of Fayettelle, Tenn. The first association bought 3,800,000 and the other sociation bought 1,200,000, claiming that by getting these plants advanced their crop of cabbage sufficiently to permit them to ship .bbage to the northern markets in competition with Crystal Springs, iss., and points farther south and on account of being nearer to e markets created a new industry for those people. Of course, at lettering was put on afterwards. That, of course, was sent to e without soliciting on my part and we used it for advertising ırposes, and I had the lettering put on there and the photograph produced.

The CHAIRMAN. All right, Mr. Geraty. Are there any questions, ntlemen?

Mr. WILSON. We have not heard any letters from Muskegon, ich.

Mr. GERATY. I have them, sir; I don't know whether from that rticular point, but I have plenty from Michigan, Wisconsin, Iowa, innesota—here is one from Ada, Mich. It says:

certainly will know the place to purchase cabbage plants later on. They did s; couldn't wish for better cabbage. I have had them to use for over a month and regard to heading are at least 60 days ahead of my other plants I raised. Many nks for the trial lot. Now, I want you to let me know how late they will stand st and what is the earliest date I can set them out here, as I want to set out quite a . Everyone thinks I have fine cabbage.

[illegible] from Kingsley, Mich.
[illegible]
[illegible]

[illegible] with your cabbage plants. They [illegible] much earlier than [illegible] and [illegible] and were just [illegible] for the plants and [illegible] next spring.

Mr. [illegible]. What is that?

Mr. [illegible]. That is from Miss [illegible] Kingsley, Mich.

[illegible]

[illegible] and grew much [illegible] but [illegible] earlier, but we didn't get them [illegible] them. As we only [illegible]

[illegible] Here is one from [illegible]

[illegible] We are inclined to think [illegible] I submit with pleasure a collection [illegible]

Mr. [illegible]. I see you have one from Kamela, Oreg., grown a [illegible]

Mr. [illegible]. Do you think the plants grow a mile high?

Mr. [illegible]. [illegible] grown up in the mountains, where the [illegible] difficult to grow stuff there.

Mr. [illegible]. This applies only to the cabbage plant, or does it apply to other plants?

Mr. [illegible]. It applies to cabbage and plants of the cabbage family. It applies to a certain extent, to lettuce, but not so much so as it does to cabbage. We grow a lot of lettuce plants, and it helps them some, but not as much as the cabbage. It applies to Brussels sprouts and cauliflower, and all of the cabbage family.

Mr. WILSON. Your idea is to have this appropriation so that the department may buy or purchase from you?

Mr. GERATY. No; not purchase from me. I do not care two straws whether they purchase from me or not. I will give them a lot of plants.

Mr. WILSON. You want the department to send them out?

Mr. GERATY. I want them to send them out; yes, sir.

Mr. WILSON. Just like you are sending them out now?

Mr. GERATY. Yes, sir.

Mr. HAWLEY. As a part of the congressional seed distribution?

Mr. GERATY. Yes, sir.

Mr. ANDERSON. Just like they send out strawberries?

Mr. GERATY. No; more like they send out the seed.

The CHAIRMAN. Mr. Geraty, I think it would be very well for you to discuss with the committee, very briefly, any mechanical difficulties that might occur to you in the distribution of those cabbage plants through the department. You understand, of course, that the department puts up the seed that are distributed under this item in little packages and the Congressman is requested to furnish addressed franks, which are pasted upon the packages by employees of the department. Now, would there be any difficulty in your proposal in getting those plants addressed and sent through the mail, just as the little packages of seed are sent out?

Mr. GERATY. None at all, sir. I have a folder here. This is a rapper which we use [exhibiting wrapper]. When it gets over 200 lants, we use a box, but in smaller quantities we use wrappers of arious sizes made in this style. This is a wrapper we use for sending ut from 50 to 75 plants and I think the way for the department to nd them out would be to make similar wrappers and have them lready printed for the addresses with the Congressman's name, just xactly as they print those little slips now. That could be printed on e wrapper and those wrappers could be addressed in the same anner as the slips are now addressed. Then they could be sent to e or whoever the department bought these plants from and be ailed out. I think the people who grow these plants know—I know e season of the year when the plants ought to be used in every unty in the United States. So you could send these wrappers to e men growing the plants and then let them send them out at the oper time for planting in the particular territory in which they are be used and get a certificate from the postmaster where he mails ese plants certifying that on such and such a date he mailed so any packages containing so may plants, and then the department n pay the men according to the postmaster's certificate.

The CHAIRMAN. Your idea would be to have somebody detailed om the department to supervise the shipping or mailing of these ants?

Mr. GERATY. Yes, sir; either that or, if you are willing, to accept e postmaster's certificate. It might be much better to have an ent of the department, and then there would be no chance for aud.

The CHAIRMAN. That would be a matter of detail.

Mr. GERATY. That would be a matter of detail. It would be easy ough to handle it.

Mr. STEELE. Do you send them out moist or with dirt or something keep them alive?

Mr. GERATY. No, sir. Here is the way we send them out [exbiting plant]. Of course there is no moisture of any kind. Our perience has been that when you go to work and put plants in the ail, you have to put them in practically air-tight packages, because you do not, the sand and stuff on the roots would get into the mail cks and injure the other mail. At first, we used to pack them in a ntilated box and where we did that we packed them in with damp oss. But we got complaints from the Post Office Department that e sand sifting through the vents injured the other mail. So then had to pack them in an air-tight package, and just as soon as we t them in an air-tight package we found that with the moisture d without circulation, they generated a heat which would cause e plants to mold and rot. But that plant [indicating], you could t kill it. That plant will stand for three weeks. I have shipped ose plants out into Oregon and into the State of Washington. d we put these instructions on the package:

MPORTANT.—Open package and put plants in a bucket of water immediately on val; let them remain in the water four or five hours or over night, then plant in l watered soil. Plants will probably have a dry, dead appearance, with outer ves yellow when received. These outer leaves will fall off after planting, but as plants grow from the bud, this will not make any difference in crop produced.

And we have found that without packing them in with moisture of any kind, we can deliver them anywhere in the United States or Canada, and that is as far as we expect to ship them at the present time.

Mr. LESHER. About how many plants could you ship in that package?

Mr. GERATY. This holds about 25.

Mr. LEE. The average small family would order about that size?

Mr. GERATY. From 25 to 50 plants is the average for an order for a small family; yes, sir.

The CHAIRMAN. Dr. Corbett, do you happen to recall the amount of money the department spends out of this appropriation for the distribution of cabbage seed?

Mr. CORBETT. It is about $5,000, I think—yes; $5,750 last year.

The CHAIRMAN. For cabbage seed?

Mr. CORBETT. Yes, sir.

The CHAIRMAN. Have you ever considered this proposition?

Mr. CORBETT. I think I talked with Mr. Geraty last year, and I looked into it a little, Mr. Chairman. And Mr. Shoemaker went down there. Our tendency has been, all along, to break away from the distribution of plants, pretty largely. If you will remember, we had at one time a distribution of grapevines and citranges, etc. Of course, the grapevine distribution was discontinued very largely on account of the diseases that interfered with it and the citranges for other reasons. But the seed distribution is rather a high-speed proposition and any factors that tend to complicate it, in our experience, tend to lessen its value. We have therefore concluded that simplifying it by spending the money pretty largely for seeds has been very beneficial in the distribution in general.

The CHAIRMAN. I can understand, of course, why you would discontinue the distribution of grapevines and citranges. You did that on account of the canker outbreak in the country recently.

Mr. CORBETT. Oh, before that; the citrange distribution was discontinued a few years ago.

The CHAIRMAN. You used to distribute fruit trees, I recall, many years ago. That distribution was discontinued, I take it, because you could not supply the demand.

Mr. CORBETT. That is pretty largely the case; yes, sir.

The CHAIRMAN. And I presume, too, because of the bulkiness of the packages and the delay in the distribution.

Mr. CORBETT. That is it.

The CHAIRMAN. It seems to me, just at first blush, that you would not experience the same difficulty by a proper working out of the details of the distribution of these plants that you would in the distribution of grapevines, citranges, pecan trees, and these strawberry plants that you are now distributing.

Mr. CORBETT. The mechanical difficulties in the distribution of grapevines were not so very serious, because we controlled the actual distribution ourselves. The grapevines were sent to us and were properly packed and distributed, and of course the number was very small. But the tendency has been heretofore, as I think you gentlemen will agree, to increase the number of units of distribution.

The CHAIRMAN. Yes; I think that is true.

Mr. CORBETT. And, of course, we can get more units out of seed han we can out of plants.

The CHAIRMAN. The question in my mind is this: Could we more rofitably expend the $5,750 that you are now expending for the istribution of cabbage seed by continuing the distribution of the eed, or could it be more profitably expended by adopting the sug- estion of Mr. Geraty?

Mr. CORBETT. There are about 15,000 pounds, I think, of cabbage eed in the ordinary distribution. Each pound will give us about 00 to 120 packages, and each package about 800 seed—between 800 nd 1,000. Now, that 15,000 pounds, you see, figuring 100 pack- ges to a pound, would be 1,500,000 packages. Of course, you can ee that will reach a great many people and the number of seeds in ach package ordinarily would give the individual as many cabbage lants as required.

Mr. HAWLEY. How many packages could you supply out of 10,000 worth of these plants?

Mr. GERATY. It depends on how many plants.

Mr. HAWLEY. Say, 25 plants.

Mr. GERATY. Two dozen plants; say, 24 plants. That would ive two varieties. You could supply 400,000 packages for $10,000.

There is one thing I wish to state and that is that in supplying a package of cabbage seed you are supplying that man practically all he cabbage plants that a family could use, but you are not supplying im anything that he can not get elsewhere. If he gets these plants, hat will give him a cabbage plant that will produce a head of cabbage three weeks or a month earlier than he could get cabbage out of his own garden. That is, with the seed, he is getting something that he ould go to any drug store or neighboring grocery and duplicate; whereas one single head of cabbage produced from these plants is of more actual value to that man than the entire collection of seed he gets from the department. From the department he gets an assort- ment of seed that he can duplicate in any drug, seed, or general store for 2 to 2½ cents, whereas a single head of cabbage from one of these plants, at the time he gets it, is worth from 20 to 25 cents, and he should produce at least 20 heads from a package of 24 plants.

Mr. HELGESEN. And in the northern country, in fact, the seed they send out won't produce anything, because they are largely southern seed? And down South they happen to have a little soil that raises anything so far as the climate will permit, because they do not have anything to contend with.

Mr. GERATY. If these plants were secured from us by the depart- nent, of course our guarantee would go to the department just the ame as it does to the individual, that if the plants fail to make good we would not get paid for them. That is the way we have always lone business.

Mr. HAWLEY. Mr. Chairman, my thought would be that you dis- continue your seed appropriation of $5,750 and add on this $10,000. That would be $15,000, and then you would get, apparently from hese statements, good results.

Mr. LEE. Each Congressman would get about 1,000 packages.

Mr. GERATY. And then the Congressman would send something to is constituent that I candidly believe will be appreciated a thousand

times more than the package of seed you are sending out at the present time.

Mr. LEE. The trouble is you could not reach enough people.

Mr. HELGESEN. You had better reach a few and give them something that is really worth something than to reach a good many and give them something that is not worth anything.

Mr. GERATY. I am a postmaster, and of course I am really in a market-gardening section——

The CHAIRMAN. How did you pass the examination? Didn't you have to take the civil service examination?

Mr. GERATY. No, sir; my office happened to be a second-class post office.

The CHAIRMAN. Oh, I see.

Mr. GERATY. That is another thing. We have a second-class post office out there on the farm, the only second-class post office in our congressional district.

Mr. WILSON. Were you in George Legare's district?

Mr. GERATY. Yes, sir; I was in George Legare's district.

Mr. WILSON. You knew George?

Mr. GERATY. We were born and raised right together.

The CHAIRMAN. And you were for him?

Mr. GERATY. I was for him. And that is another thing; and on account of George's death I took it up with Mr. Lever—the Government was kind enough, when it put the parcel post into effect, to put into that law that everything produced on the farm could be shipped by parcel post, at the regular parcel-post rates, excepting plants, bulbs, roots, seeds, and scions.

Mr. ANDERSON. We fixed that last year.

Mr. GERATY. You fixed that last year, but it took two years to get it fixed. That made it absolutely impossible for us to get our plants to a man in the rural sections, unless the man lived on a railroad line and we could send the plants by express.

Mr. OVERMYER. You started to say something and that led up to this discussion about your being postmaster. You were going to explain something about the distribution of seeds, something that came to your knowledge by reason of being postmaster.

Mr. GERATY. I was going to say that Senator Tillman and Congressman Whaley send seed to our district, and we got in there at one time, I think it was, something like 10 or 12 mail sacks of seeds into our post office and there was not 10 per cent of that seed that was carried out of the post office. Those packages were thrown down on the post-office floor and I had to gather them up and put them in the furnace of the heating plant. That is a condition that actually existed in that post office. Of course, we are in a market-gardening section, and it is the largest market-gardening and vegetable growing section south of Norfolk. We have one section there of over 12,000 acres where early vegetables are grown for the market and this was seed addressed to men in that community and naturally they were never carried out of the post office.

Mr. HELGESEN. I notice in your instructions here that you advise them to use 2,000 pounds of fertilizer per acre. Now, when you send plants into those northwestern States, where they never use fertilizer, is not this rather misleading? Doesn't it make them think

hey can not be raised without fertilizer, and wouldn't it be well to ıave separate instructions for the various localities?

Mr. GERATY. Of coures, I would not have anything to do with hat. The department would be informed as to the conditions in hose northwestern States. But you can not put too much fertilizer ın a vegetable crop. When we first started to grow market garden tuff, we used about 500 to 800 pounds of high-grade fertilizer per ıcre that would analyze, say, 7 per cent phosphate, 10 per cent ımmonia, and 5 per cent potash. And the most successful market ;ardeners are all using fertilizer.

Mr. HELGESEN. I understand that; but you take Grand Forks, one ɔf our largest cabbage sections and market-gardening sections. They ıave a soil that is 5 or 6 feet deep with a black loam, and they do ıot think of doing it; and if those people got the idea they could not ;aise these plants without fertilizer they would not buy them.

Mr. GERATY. Of course, in our circular which we send out we state when they have manure to fertilize the soil these conditions are not ıecessary; it is only the sandy lands of the South where we have no ıatural fertilizer and have to build up the soil.

The CHAIRMAN. We are very much obliged to you for your inter-esting statement, and I will state to you that the committee will take the proposition under very serious consideration when we reach that item in the bill.

Mr. STEELE. And I will say that I am in favor of raising the funds from ten thousand to twenty thousand. There is one place where I will be for favoring an increase.

Mr. GERATY. I might say that the entire seed trade is fighting this seed distribution tooth and nail, but they are in favor of the distribution of plants because it will increase their business. This is a thing that does not come in competition with them.

(Thereupon, at 11.30 o'clock a. m., the committee went into executive session, and at 12.15 p. m. took a recess until Monday, January 17, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Thursday, January 27, 1916—5 p. m.

STATEMENT OF MR. HENRY S. GRAVES, CHIEF OF THE FOREST SERVICE.

The CHAIRMAN. Gentlemen, on page 88 of your Book of Estimates you will find the beginning of the Forest Service, and I would like, if possible, this afternoon to complete the statutory roll. Mr. Graves will present the statutory roll.

I notice your first change is in item No. 4, one forest supervisor, $2,800, in lieu of one forest supervisor, at $2,600, with increase of $200.

Mr. GRAVES. This is a requested promotion for the supervisorship of the forests of Alaska. We have one supervisorship for the two Alaskan forests. One man has charge of the Tongass and the Chugach National Forests, an area agregating something over 20,000,000 acres. The position is a more responsible one than that of the ordinary supervisor, not only because of the large area of land under administration, but, on account of its being farther away from our headquarters, we give a larger amount of direct responsibility to the local officers. In addition to that, the cost of living in Alaska is higher than it is in the States. The incumbent in this position has been there for four years. He was a man selected from among all the supervisors because of his peculiar qualifications for that responsible work, and we are recommending that he be promoted $200.

Mr. STEELE. How long has he been in the service?

Mr. GRAVES. Since 1904.

The CHAIRMAN. How does this salary compare with the salaries of the other supervisors in this country?

Mr. GRAVES. There is one position at $2,700; the next lower is $2,400, in which I think there are eight; then they run down to $1,800. The average salary of supervisors is about $2,000.

The CHAIRMAN. Take up your next change. Following item 5 is one forest supervisor, $2,600, changed to one forest supervisor, $2,800.

Mr. GRAVES. That is a supplement to item 4.

The CHAIRMAN. The next one is in item 20—650 forest rangers, at $1,100 each (the word "assistant" is omitted from the title "assistant forest ranger"). What is the trouble there?

Mr. GRAVES. This is in the interest of simplification of our titles. When the forests were first established the number of competent

and experienced rangers was less than we have now, and we had two grades—the forest ranger and the assistant forest ranger—the design being that the latter would be under the direction of the forest ranger. With the further development of the forests and the intensification of our work we have been placing these assistant forest rangers each in charge of a district, so that their duties are essentially the same as the forest rangers. It seemed, therefore, more desirable to call them all forest rangers than to have a portion of them designated as forest rangers and the rest assistant forest rangers.

The CHAIRMAN. Are there any questions, gentlemen? If not, your next item is 25, 21 clerks, at $1,600 each (increase of 1 by transfer from lump fund for general administration). Has the lump fund been reduced correspondingly?

Mr. GRAVES. Yes, sir. We are requesting that 22 places be transferred from different lump sums to the statutory roll; the lump sums have been correspondingly reduced, and there is no change in any case of the salaries of the employees holding the positions.

The CHAIRMAN. That statement, then, will cover all of your transfers from the lump-sum fund to the statutory roll?

Mr. GRAVES. Yes, sir; no increase is involved in any of those transfers.

The CHAIRMAN. Item 28 is one of those transfers, I take it?

Mr. GRAVES. A transfer.

The CHAIRMAN. Also items 29 and 30?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. Item 35 is a transfer also?

Mr. GRAVES. That is a transfer and a change of title.

The CHAIRMAN. Why are you asking that change?

Mr. GRAVES. We are asking for a change of title in a number of instances in the interest of the standardization of our grades and also to give us a somewhat greater elasticity to the roll in filling vacancies, following a practice common in the department. We found we needed a proof reader. We secured one by transfer from the Government Printing Office, I believe, and we now find that it is a position which we wish to make permanent, and therefore we ask to have it transferred to the statutory roll. At the same time, in case of a vacancy in this position we would be somewhat better off if we could fill it either with a clerk or a proof reader, because we are likely to have in our organization some person now on the clerical list fully familiar with the work of the Forest Service and its needs with respect to publications and the character of the material about which we write; so that in filling that vacancy we might find some one in the Forest Service whom we could promote to that position who could carry the work on and thereby not have to go to the register or to some other department for a transfer. It would give us a little greater latitude in filling a vacancy.

The CHAIRMAN. Let me ask you this question, in order to get it in my own mind. If the committee did not allow these changes in designation here, could you still go on and do this work?

Mr. GRAVES. Yes, sir. We are transferring a position of proof reader to the statutory roll. That is now filled, and very satisfactorily filled, so that nothing actually would happen unless in case of a vacancy. We do not anticipate a vacancy, but if that should happen it

[illegible] this change of title. It is not absolutely [illegible]

The CHAIRMAN. Is it essential?

Mr. GRAVES. No, sir.

The CHAIRMAN. Yes. I understand, of course, the attitude of the committee [illegible] men can not possibly be as familiar with these [illegible] as those who are in charge of them, and it makes it necessary [illegible] to explain to the Members on the floor just why one of these changes is made.

Mr. [illegible] several changes of this kind recommended in the bill to-day?

The CHAIRMAN. Item 36 is a change in designation and a transfer?

Mr. GRAVES. That is a transfer from the lump fund to the statutory roll, and also a change in designation for the same general reason, as already explained. It is an old grade, in which there is only a single position.

The CHAIRMAN. It might be a clerk or translator, or either or both?

Mr. GRAVES. In case of a vacancy we would be somewhat better off if we could fill it either from the register for clerk or the register for translator.

The CHAIRMAN. Does the same explanation apply to item 40?

Mr. GRAVES. Precisely the same situation there; yes, sir.

The CHAIRMAN. That is true of item 41?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. And of item 42?

Mr. GRAVES. Yes, sir. Exactly the same explanation.

The CHAIRMAN. Is that also true of item 46?

Mr. GRAVES. Yes, sir. In the case of item 46 we are requesting change of title of one topographic draftsman to draftsman for the purpose of simplifying titles.

The CHAIRMAN. Does that leave any topographic draftsmen on your statutory roll?

Mr. GRAVES. We have no topographic draftsman on the statutory roll at present. That would eliminate that title.

The CHAIRMAN. Your next item is No. 51, which involves, I see, a little increase of $180.

Mr. GRAVES. Yes, sir. That is a request for promotion of a map colorist from $720 to $900. The entrance salary for map colorists is now $900. That is a position which has been in the Forest Service a good many years. It was one of a large number of positions put on the statutory roll a few years ago, when all of the clerical and subclerical positions were transferred to the statutory roll. Seven hundred and twenty dollars is too small to get a competent map colorist.

Mr. HAWLEY. How long has this man been on your rolls?

Mr. GRAVES. It is a young lady. She has been on the rolls three or four years. She likes the work and would like to remain with us, and we have encouraged her by telling her we would recommend that her salary be placed at the minimum entrance salary for this grade of work.

The CHAIRMAN. All right. Item 52 seems to be one of your transfers and changes in designation?

Mr. GRAVES. The explanation given a few moments ago applies in this instance also.

The CHAIRMAN. That is true also of item 53?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. Now, item 54; I understand you have a supplemental estimate on that?

Mr. GRAVES. Yes, sir; item 54; one artist receiving $1,400. There is a recommendation for a promotion of $200. This was recommended in a supplemental estimate or letter by the Secretary. It was included in the recommendations which I made to the Secretary in connection with the estimates for next year, and in making up the Book of Estimates this increase was overlooked.

Mr. HAWLEY. Does this affect some particular person who is now in the employ of the service, or is it just to create a new grade?

Mr. GRAVES. It affects a single person and also the grade. The reason why it affects the grade is that this work is identical with the work in similar positions in other bureaus. For instance, in the Bureau of Plant Industry there is a position at $1,620 in which identically the same class of work is required, or as near as is possible to make comparison between two bureaus.

The CHAIRMAN. I would ask at this point that you insert the letter of Secretary Houston on this proposition.

(The letter referred to follows:)

DEPARTMENT OF AGRICULTURE,
Washington, January 7, 1916.

Hon. A. F. LEVER,
Chairman Committee on Agriculture and Forestry,
House of Representatives.

MY DEAR MR. LEVER: In the consideration of the estimates for the fiscal year 1917 one item submitted by the Forest Service was overlooked. I refer to the recommendation for the promotion of an artist from $1,400 to $1,600. Mr. Graves has called my attention to the special circumstances of the case and the reason for his request. The employee concerned has been in the department more than 14 years and during that time has performed the art work of the Forest Service connected with illustrations for publications and the preparation of materials for exhibits. Her work is of exceptional quality. The salary she receives is lower than that paid to employees performing similar work in other bureaus, as, for example, in the Bureau of Plant Industry, where the position pays $1,620. It is believed that her salary should be equal to the standard in those bureaus, in the interest of justice and good administration. I would appreciate it if you will consider this recommendation with the others which have been made in the estimates, and I hope that the committee will approve it. The item in question is designated in the estimates as No. 54.

Very truly, yours,

D. F. HOUSTON, *Secretary.*

Mr. GRAVES. It affects the individual for the reason that the incumbent in this office has been in the Forest Service for nearly 15 years. The work is high-grade illustrating for publications, free-hand drawings of botanical and other illustrations. The artist also colors lantern slides for our collection; she also colors the transparencies and bromides used in exposition work.

The CHAIRMAN. How long has she been at this salary?

Mr. GRAVES. Since 1910. May I recall that the titles which we are suggesting—like one clerk or compositor, one draftsman or surveyor—are similar to the titles in the department generally. It is a frequent thing to have titles of that kind.

The CHAIRMAN. Your next change seems to be on page 92 of the book, item 62, "One blue printer (by transfer from lump fund for miscellaneous forest investigations)." The same explanation applies to that item, I presume?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. Also a change?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. Also a change, and in addition a change in designation?

Mr. GRAVES. This is a change of designation; in that case not only for the reasons which I have explained in the case of some of the other changes of title, but to enable us to secure more nearly the kind of person we need from the civil-service register.

Mr. HAWLEY. What is he called now—laboratory aid or engineer?

Mr. GRAVES. The present title is laboratory assistant. There is a register under the civil service for laboratory aid or engineer, and that somewhat more nearly meets our requirements than laboratory assistant.

Mr. STEELE. Sometimes you ask for a change of title to meet the kind of work and the qualifications of the particular man, do you? Then, in case that man gives up his position, you might need another change of title to meet the qualifications of one who takes his place?

Mr. GRAVES. I understand that is not the case here. In case of a vacancy this register gives more nearly the kind of assistants we need than the other.

Mr. HAWLEY. The proposition is to provide for a position that may be filled without respect to persons?

Mr. GRAVES. Yes, sir.

Mr. STEELE. Sometimes when a man has filled a certain position and becomes very efficient, do you try to get a title that will meet his capacity and qualifications, call him something different, and give him a larger salary?

Mr. GRAVES. It may happen that we promote men of that sort to an entirely different position having larger responsibilities and somewhat different activities, as, for instance, one of our employees holding a given title, say supervisor of a forest, may be so proficient that we will promote him to assistant district forester in the district forester's office. Is that what you had in mind, Mr. Steele?

Mr. STEELE. Yes; I think that answers the question.

The CHAIRMAN. Items 69 and 70 seem to be transfers only.

Mr. GRAVES. Yes, sir.

Mr. HAUGEN. But, in fact, it is an increase, is it not? Do you decrease the lump sum to correspond with the increase here?

Mr. GRAVES. In every transfer from the lump-sum to the statutory roll the lump sum from which it is taken is correspondingly decreased.

Mr. HAUGEN. In all cases?

Mr. GRAVES. In all cases; and there is no increase in salaries.

The CHAIRMAN. What about item 70?

Mr. GRAVES. That is identical with item 68.

The CHAIRMAN. That brings us down to item 86, in which you seem to have an increase of one by transfer of a messenger at $360 to the Secretary's roll.

Mr. GRAVES. Yes, sir.

(Thereupon, at 5.15 o'clock p. m., the committee took a recess until Friday, January 28, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Friday, January 28, 1916.

The committee met at 3 o'clock p. m., Hon. Asbury F. Lever (chairman) presiding.

STATEMENT OF MR. HENRY S. GRAVES, CHIEF OF THE FOREST SERVICE—Continued.

The CHAIRMAN. Turn to page 94 of your Book of Estimates, general expenses of the Forest Service, item 91. Doctor, there seems to be no change in your general language at all.

Mr. GRAVES. No, sir.

The CHAIRMAN. Now, Doctor, you have there a number of individual forests—155, I believe?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. I see that there have been slight changes in the amounts of these, and if you will make a general statement covering that I think it will be all that the committee can expect. Don't you think so, Mr. Hawley?

Mr. HAWLEY. Yes, sir.

Mr. GRAVES. There are a good many small changes in the individual items of appropriation for the different national forests. There are from year to year fluctuations in the business of the forests and needs of protection, which make it necessary to shift men in the organization from one forest to another, in accordance with the needs of the business. For example, a new timber sale may require one or two more forest assistants than were previously employed on a given forest. A timber sale of any size would require one or more scalers or other assistants. We therefore shift about our men from forest to forest in accordance with the needs. I have made a detailed statement showing the reasons for the increases and decreases in each one of these items, which I will file with the committee.

The CHAIRMAN. Without objection, that will be inserted as a part of the record at this point.

(The statement mentioned follows.)

Statement showing reasons for increases and decreases in the subappropriations under general expenses for the individual national forests.

Absaroka.—No change.

Alamo.—Increase, $644, due to necessity for rental of winter headquarters in Alamogordo during winter months, for payment of rental of water at a ranger station, and for increased travel expenses due to the assignment of a ranger as an administrative assistant to the supervisor's staff.

Angeles.—Decrease, $3,008, due to the transfer of 6 six-month rangers from the miscellaneous to the statutory roll. This reduction in miscellaneous funds was partly offset by a $300 increase in wages for the employment of additional forest guards during the season of fire danger.

Apache.—Decrease, $688, due to a reduction in amount allotted for forage, which was brought about by raising forage crops on administrative sites cheaper than it could be purchased in the open market.

Arapaho.—Decrease, $957, due to a reduction in the special protective force made possible by the creation of the Rocky Mountain National Park from a portion of the Arapaho.

Arkansas.—No change.

Ashley.—Increase, $869, results from the need for employing additional fire protective guards to properly protect the forest resources, and for miscellaneous forest expenses.

Battlement.—No change.

Beartooth.—The increase of $1,211 is due to the necessity for hiring additional assistance for administering the timber-sale business, which has increased during the past year. Of this sum $1,000 is needed for wages and $211 for miscellaneous expenses.

Beaverhead.—Increase of $631 is due to the fact that more intensive fire protection has been found advisable and this amount is needed for the hire of additional short-term men and the installation of fire equipment.

Bighorn.—Decrease, $2,530, due to inactivity in the timber-sale business which allowed of a reduction in the force of a forest examiner at a salary of $1,600 and a forest assistant for six months. A small reduction was also possible in miscellaneous expenses.

Bitterroot.—No change.

Blackfeet.—Decrease of $2,222 results from a reduction that has been found possible in miscellaneous expenses and through the transfer of a ranger on the miscellaneous roll to the statutory roll.

Black Hills.—Increase, $900, in wages and miscellaneous expenses due to the addition of the area formerly comprised within the Sundance Forest to the Black Hills Forest.

Boise.—Decrease, $1,429, due to the transfer of a forest examiner to another forest on account of inactivity in timber-sales business and a small decrease in miscellaneous expenses.

Bridger.—Increase, $791, due to the transfer of a portion of the Washakie National Forest to the Bridger administration. This results in a more efficient and economical administration.

Cabinet.—No change.

Cache.—Increase, $482, is caused by the need for providing wages for a number of additional patrolmen during the season of fire danger and also a small additional amount for miscellaneous expenses.

California.—No change.

Caribou.—Increase, $280, due to need for additional funds for miscellaneous expenses.

Carson.—Increase, $606, due to the removal of the supervisor's office from Tres Piedras to Taos where a higher rental must be paid and on account of the location of Taos in relation to the forest, travel expenses are increased.

Cascade.—Decrease, $2,133, is due to reduction in the number of forest guards comprising the special fire protective force which was brought about by a reorganization of the force after a careful examination of the fire plan of the forest had been made.

Challis.—No change.

Chelan.—No change.

Chiricahua.—Decrease, $527. In view of a thorough examination of the forest it was determined that a reduction in the temporary protective force could be made without jeopardizing the timber resources.

Chugach.—No change.

Clearwater.—No change.

Cleveland.—No change.

Cochetopa.—Increase, $499, due to the need for the employment of additional forest guards to properly safeguard the forest resources from fire.

Coconino.—Increase, $1,606. The need of additional funds for employment of a larger temporary force for fire protection was apparent after an examination of the fire plan of the forest had been made. The need for rental of an additional room for the supervisor's headquarters has also caused a small increase.

Coeur d'Alene.—No change.

Colorado.—Increase, $827, due to the need for the employment of additional protective guards during the fire season on account of a large increase in tourist travel on the forest, which creates an additional hazard.

Columbia.—No change.

Colville.—No change.

Coronado.—Increase, $581, due to the need for increasing the temporary protective force, since it was found upon examination that the existing force was too small to properly protect the forest.

Crater.—Decrease, $717, results from the transfer of a forest assistant to another forest on account of inactivity in the timber-sales business. This saving is partly offset by an increase in miscellaneous expenses for travel, the purchase of additional fire-fighting tools, freight, etc.

Crook.—Decrease, $991. A reduction in the temporary protective force was found warranted after an examination had been made of the fire plan of the forest. Likewise a small reduction in the amount allotted for forage was possible in view of a reduction in the yearlong ranger force.

Custer.—Decrease, $1,370, results from a transfer of a ranger from the miscellaneous to the statutory roll and a reduction in the cost of forage.

Dakota.—No change.

Datil.—Increase of $3,050 needed as a result of the assignment of a $1,400 forest examiner to the supervisor's staff, whose services are needed to handle the timber-sale business and be in direct charge of the fire-protective force. The need for five additional short-term men for adequate fire protection results in an additional increase of $1,650.

Deerlodge.—Increase of $2,449 needed as a result of increased timber-sale business. Two additional forest examiners are required to help handle this business, one yearlong and the other for eight months.

Deschutes.—Decrease, $550, results in a reduction in the amounts hitherto allotted for the purchase of fire-fighting tools and for other miscellaneous expenses, such as travel, forage, etc.

Dixie.—No change.

Durango.—No change.

Eldorado.—Increase, $2,821, due to the need for employment of five additional lookout and patrol men during the fire season, past experience having proved that the force was inadequate to give the degree of protection justified in view of valuable resources in this forest; also to provide for a larger supply of fire tools and equipment.

Fillmore.—No change.

Fishlake.—Decrease, $1,639, due to a reduction of about $1,000 in the special fire protective force, since upon careful examination it was determined that this can be done without assuming undue risk; a further reduction in miscellaneous expenses is also made.

Flathead.—Increase of $2,437 needed to provide additional assistance for handling increased timber-sale activity. It is expected to spend $2,000 more than last year for wages of scalers and $437 for expenses such as supplies and travel.

Florida.—No change.

Fremont.—No change.

Gallatin.—Decrease of $884 in the amount for wages of scalers made possible by a falling off of the timber-sale business.

Gila.—Decrease, $1,423, due to transfer of a clerk from the miscellaneous to the statutory roll and terminating the appointment of a forest guard hunter and trapper.

Gunnison.—Increase, $1,035. Additional funds were found to be needed to increase the special fire protective force by several lookout and patrol men in order to give sufficient protection to forest resources.

Harney.—Decrease, $375, is due to a reduction in amount hitherto expended for fire tools.

Hayden.—Increase, $495, due to need for the employment of the forest assistant yearlong instead of only for six months, on account of increased activity in timber-sale work. The total increase is partly offset by a decrease of over $100 in travel expenditures.

Helena.—No change.

Holy Cross.—No change.

Humboldt.—Increase, $967, due to the need for increasing the number of forest guards, who comprise the special fire-protective force, and for the purchase of additional fire-fighting tools.

Modoc. Increase $[illegible], results from the assignment of a forest examiner to handle the increased timber-sale business. A small reduction was made in wages and subsistence in the special protective force.

Mono. No change.

Monterey. While the miscellaneous expense will increase slightly, a net decrease of $[illegible] in the allotment is possible as the result of transferring a ranger from the miscellaneous to the statutory roll.

Mount Hood. Decrease $[illegible]. An increase of $1,200 was found necessary to provide for the employment of a number of patrolmen, fire lookouts and patrolmen. A further increase of about $[illegible] for miscellaneous expenses is also needed.

Oconto. No change.

Ouachita. [illegible].

Ozark. Increase, $[illegible], is made necessary by the need for paying the wages of five [illegible] forest guards who will be used in fire protection, and for [illegible] necessary for employing the special [illegible] having been determined that the forest [illegible] from fire demanded in the [illegible].

Payette. No change.

[illegible] Increase $[illegible] in the amount previously allotted [illegible] changes made in the fire plan.

[illegible] Increase $[illegible] for the need for the employment of eight additional [illegible] the season of fire danger and to provide [illegible] special fire-protective force for a longer [illegible] if forest resources are to be adequately protected [illegible].

[illegible] No change.

Pisgah. Decrease $[illegible], $1,100 is due to transfer of a clerk from the [illegible] $370 was taken from the amount hitherto allotted for the purchase of horses, while the balance of decrease was on account of a reduction in the number of forest guards employed for fire-protective duties.

Plumas and Clark. Decrease, $1,190, due to transfer of a forest ranger from the miscellaneous to the statutory roll and slight reduction in miscellaneous expenses.

Lincoln. No change.

Polo. Decrease, $1,184, as a result of transferring a forest ranger to the statutory roll and reduction in travel expenses due to the transfer of a scaler to another forest.

Luquillo. No change.

Madison. Decrease, $2,345, due to the transfer of two forest rangers from the miscellaneous to the statutory roll.

Malheur. No change.

Manti. Decrease, $1,870, due to transfer of a forest assistant at a salary of $1,200 to another forest on account of inactivity in the timber-sales business, and a reduction of $670 in the amount hitherto expended for wages of the special fire protective force, which is made possible by a redistribution of forces.

Manzano. No change.

Medicine Bow. Increase of $3,630, due to the need for employment of two forest assistants to handle the increased timber-sale business, and for wages for employment of laborers for brush burning resulting from old slashings, and to employ additional fire-protective guards, since it has been found that present protective force is inadequate to properly protect forest resources.

Michigan. No change.

Minam. Increase of $670 is due to the need for paying the wages of additional scalers to handle the increased timber-sales business of the forest.

Minnesota. Decrease, $1,889, of which $1,100 results from transferring a forest assistant to investigative work covered by a specific appropriation. A careful examination of the fire plan of the forest showed that a reduction in the special protective force could be made without jeopardizing forest resources.

Mondeola. No change.

Monongahela. Decrease, $1,102, due to the transfer of a forest ranger from the [illegible] to the statutory roll.

Nevada. No change.

Ouray. Increase $1,462 due to the transfer of [illegible] six month statutory ranger [illegible] to another forest in exchange for which the Mono Forest receives $[illegible] miscellaneous funds to employ four forest guards for fire protection

or a period of three months, thus providing a more effective protective organization. The balance of increase is for the purpose of purchasing additional fire supplies and equipment.

Monterey.—Increase, $799, is to provide for the wages of three additional patrolmen during the period of fire danger and for the purchase of additional fire-fighting tools. A careful examination of the fire plan of the forest, together with previous experience in combating fires, indicated that this increase is necessary to safeguard forest resources.

Montezuma.—Decrease, $342, due to a reduction in miscellaneous expenses.

Nebraska.—Decrease, $3,532, in salary of forest assistant and wages of laborers is a result of the elimination of 346,940 acres and the reorganization of the experimental-planting work.

Nevada.—Decrease of $1,471 due to the transfer of a forest clerk, at a salary of $1,200, from the miscellaneous to the statutory roll and a reduction of $271 in miscellaneous expenses.

Nezperce.—Decrease of $1,094 due to the transfer of a forest ranger from the miscellaneous to the statutory roll.

Ochoco.—Decrease of $255 results from reducing the special fire-protective force by two patrolmen, it having been determined that this action could be taken without undue risk to forest resources.

Okanogan.—No change.

Olympic.—Decrease, $580, results from the removal of the supervisor's office to the Federal building, this making a decrease of the amount hitherto allotted for rent and quarters' expenses.

Oregon.—Decrease of $403 is due to maintaining a Government-owned pack outfit which hitherto had been rented from private individuals.

Ozark.—No change.

Palisade.—Decrease, $1,237, due to transfer of a forest assistant to another forest because of inactivity in timber-sales business and a small decrease in travel expenditures due to the transfer.

Payette.—Decrease, $296, due to a reduction in miscellaneous expenses, such as travel, supplies, and equipment, etc.

Pend Oreille.—Decrease of $4,139 due to the transfer of a ranger and forest clerk from the miscellaneous to the statutory roll which reduced the amount needed by $2,000; and on account of a falling off in timber-sale business several timber-sale assistants, receiving aggregate salaries and expenses of $1,939, were transferred to other forests.

Pike.—Decrease of $1,549 is due to the transfer of an $1,800 forest examiner to another forest for work other than administrative. A small increase was made in the allotment for fire protection, since experience of previous years showed that the forest could not be adequately protected with the force available.

Plumas.—Increase, $2,487, due to the need for employment of five additional forest guards to supplement the special fire-protective force and to employ the entire protective force for a longer period. With this increase which also provides a small amount for additional fire equipment the resources of the forest will be adequately protected under normal conditions.

Powell.—Decrease, $844, due to reduction in the clerical force of a $900 clerk. A small increase is made in miscellaneous expenses.

Prescott.—Increase, $497. Lack of sufficient space in the supervisor's office required the rental of an additional room. It was determined also as a result of previous experience that it will be necessary to employ an additional short-term protective man and to employ the entire protective force for a longer period to properly safeguard the forest.

Rainier.—No change.

Rio Gande.—Increase, $856, is a result of the need for the employment of additional forest guards during the fire season to protect the timber resources of the forest, and also for miscellaneous expenses.

Routt.—Decrease, $1,102, due to the transfer of a forest assistant from the miscellaneous to the statutory roll.

Ruby.—Decrease of $381 due to a reduction in the number of forest guards employed for fire-protective purposes, and also a small decrease in miscellaneous expenses.

Saint Joe.—Decrease, $2,176, as a result of transferring several timber-sale assistants to other forests on account of a falling off in timber-sale business, and also transferring a ranger from the miscellaneous to the statutory roll.

Salmon. Increase, $2,000 of which $1,470 is due to the [illegible] of additional lookouts and fire patrolmen to adequately safeguard the forest resources which the increase of increase is needed for this purpose to expend.

San Isabel. No change.

San Juan. Decrease, $128, of which $300 is due to reduction in the amount hitherto expended for fire tools. Balance of decrease due to a reduction in miscellaneous expenses.

Santa Barbara. Decrease, $2,562, of which $1,200 was for the purchase of office furniture and for land lease, etc., [illegible] for the forest it having been ascertained that the forest was receiving the benefits of the [illegible] that were [illegible] the completion of its boundaries. $1,000 results from the transfer of a forest examiner whose services were no longer needed by reason of a reorganization of the forest [illegible] $700 is due to the fact that there is no longer necessity to pay rental for the supervisor's office since it has been moved to the Federal building, while the balance of decrease results from a reduction in traveling and other miscellaneous expenses.

Santa Fe. Increase, $1,916, due to the need for employment of a watchman to protect the cliff-dwelling ruins in Frijole Canyon, for a period of eight months and to provide for employment of the special protective force for a longer period in order to properly safeguard the timber resources of the forest.

Santa Rosa. No change.

Santiam. Decrease, $651, results from completion of timber reconnaissance work that making review of timber cruisers unnecessary.

Sawtooth. Decrease, $440, due to the necessity for increasing the number of short-term men who comprise the special fire protective force. Experience shows that the fire risk is too great if the force hitherto employed is not increased.

Selway. No change.

Sequoia. Decrease, $4,344, results from the elimination of a portion of the [illegible] and the consolidation of the Kern and Shasta Forests. In the reorganization of the new unit it was found that a reduction in the special fire protective force of eight forest guards could be made without jeopardizing forest resources and a further decrease in travel and other miscellaneous expenses amounting to approximately $1,000, is also made possible.

Sevier. Decrease, $1,082. Owing to inactivity in the timber-sales business, the services of a forest examiner will not be needed. However, it is necessary to increase the amount hitherto allotted for miscellaneous expenses by a small amount.

Shasta. No change.

Shoshone. No change.

Sierra. Decrease, $3,413, of which $1,200 results from a reduction in the special protective force of four forest guards and slightly reducing the period of employment of the entire protective force. On account of a falling off in timber-sales business, a forest examiner, at a salary of $1,500, was transferred. Further decreases are also possible to the extent of $300 in the amount hitherto allotted for the purchase of fire tools, and $300 in travel, on account of the transfer of the forest examiner.

Snoqualmie. Decrease, $1,133, due to transfer of a forest ranger to the statutory roll and slight decrease in miscellaneous expenses.

Siskiyou. Decrease, $608, is due to reduction in the number of forest guards comprising the special fire protective force, it having been found that this would not jeopardize the adequate protection of the timber resources.

Stanislaus. No change.

Steese. Decrease, $904, is due to a falling off in the number of examinations of applications for homesteads under the act of June 11, 1906, thus making unnecessary continuation of services of temporary employees who had been engaged in this work.

Snoqualmie. Increase, $2,470 is made necessary to employ additional patrolmen, during the period of fire danger to adequately patrol the rights of way of two railroads that traverse the forest and to give other portions of the forest increased protection during the fire season.

Separ. Decrease, $1,250, due to the assignment of a forest assistant yearlong who has previously been employed for only six months. It was determined that [illegible] service needed yearlong assistance to enable him to properly carry on [illegible] istrative work of the forest. Experience also showed that

dditional amount was needed for fire protection to allow of the employment everal additional guards during the period of fire danger.

anislaus.—No change.

uperior.—Increase, $932, is due to the need for employment of additional st guards during the fire season to properly safeguard forest resources.

ahoe.—Increase, $4,109, of which $2,100 results from an increase in the ial fire protective force of seven forest guards for a period of four months , a $1,500 increase is needed to employ the entire special fire force of 27 for a longer period. Both of these increases are essential if the forest urces are to be adequately protected. The balance of increase amounting 09 is needed for the purchase of an additional supply of fire-fighting tools rder that fire fighters may be properly equipped and for miscellaneous nses, such as travel, freight, hauling, etc.

rghee.—No change.

ion.—No change.

iyabe.—Decrease, $1,660, of which $1,200 is due to transfer of a clerk the miscellaneous to the statutory roll, while the balance of decrease lts from a reduction in miscellaneous expenses, such as travel, supplies, pment, etc.

ngass.—Increase, $2,095, is due to increased activity in the timber sales special use business, on account of which an additional $1,600 is needed to the wages of the increase force. The balance of increase results from the for purchase of supplies and equipment.

nto.—Decrease, $247, due to a reduction in travel expenses caused by the sfer of a forest assistant who had been a member of the supervisor's staff, ther with a reduction in the amount previously allotted for the purchase pplies and equipment.

inity.—Increase, $3,603, is due to the transfer of three 6-month statutory erships to another forest, in exchange for which an increase of $1,600 is ed to employ five forest guards to supplement the special fire-protective . The balance of increase results from the need for employing the special ective force, comprising 48 guards, for a longer period. These increases considered essential after a thorough study of the fire plan of the forest been made, taking into consideration the experiences of previous years in g with the fire situation.

sayan.—Decrease, $324, due to a reduction in the amount allotted for the hase of forage and on account of reduced travel expenses caused by a reduc- of time spent by a forest examiner in timber-sale work.

nta.—Increase, $4,079, of which $1,500 is for the salary of a forest exam- to assist in handling the timber-sales business and other technical work; an tional amount of $1,400 is needed to employ additional patrolmen for fire ection, in order to safeguard forest resources. The balance of increase is ssary because of increased rent, travel, and other miscellaneous expenses.

natilla.—No change.

npqua.—No change.

wompahgre.—No change.

alloica.—Increase, $780, is due to necessity for the employment of several porary guards to assist rangers during the grazing season in affording closer e control.

asatch.—Increase, $535, due to the need for the employment of additional st guards to adequately protect the forest and for miscellaneous expenses.

ashakie.—Increase of $9,629. The transfer of the area formerly com- d within the Bonneville National Forest to the Washakie administration increased timber-sale business results in this increase in the appropriation.

ashington.—Decrease of $267 results from a small reduction in the num- of men comprising the special fire-protective force, which was brought t by increased telephone mileage of the forest.

eiser.—Increase, $1,182, for wages and expenses of additional employees, to increased activity in timber sales.

enaha.—No change.

enatchee.—Increase, $1,526, due to need for employing additional patrol- on account of increased fire hazard caused by the large influx of campers ie shores of the numerous lakes within the forest.

hite River.—No change.

hitman.—Increase, $918, due to increased activity in timber-sales business, h requires an increased force to properly supervise the sales.

[illegible] ...ase [illegible] ...ber purchases of additional fo...
...ber [illegible] ...ber [illegible] ...constant increase.
[illegible] ...ber [illegible] ...ber [illegible] ...ber [

Mr. GRAVES. I would like to ask Mr. Greeley, the assistant forester, to answer your question.

Mr. GREELEY. The hardy pines of the Lake States have done best in Nebraska, particularly the jack pine and Norway pine. A few of the broad-leaved species, like box elder, green ash, cottonwood, and white elm, have also been successful in planting on these homesteads.

Mr. GRAVES. With reference again to item 180, there is a proviso authorizing the Secretary of Agriculture to distribute trees from these nurseries to farmers in Nebraska. If you desire to have that made continuous legislation rather than to have to include the item annually, it can be done, I believe, by inserting in the present bill the word "hereafter" after the word "that," so as to read: "*Provided*, That hereafter from the nurseries," and so on.

The CHAIRMAN. Is that language at all necessary?

Mr. GRAVES. It simply would obviate the necessity of putting this language in each year.

The CHAIRMAN. I mean is the language necessary for doing the work you are doing?

Mr. GRAVES. Yes.

The CHAIRMAN. My own idea would be to cut the language out entirely.

Mr. GRAVES. In order to have continuing authority we would have to put the word "hereafter" into the present bill.

The CHAIRMAN. We had better make a note of that, so we can make it continuous legislation.

Mr. HAWLEY. How long do you expect to continue that plan of furnishing those trees free?

Mr. GRAVES. We feel that it is very successful.

Mr. HAWLEY. How long would it take to furnish trees to all the people there who ought to have them?

Mr. GRAVES. I should think it would take a long time. I do not think we could set any limit on that. Could you, Mr. Greeley?

Mr. GREELEY. No, sir.

Mr. HAWLEY. On page 100, Mr. Chairman, item 245, that $67,000 is to provide for the care of the forests created from the Appalachian purchase?

Mr. GRAVES. Yes, sir.

Mr. HAWLEY. And for additional forests that may be created from additional purchases?

Mr. GRAVES. Yes, sir.

Mr. HAWLEY. There is no change in that?

Mr. GRAVES. No, sir.

The CHAIRMAN. Suppose you take up item 255 on page 101, and I am going to ask, Doctor, that you favor us by doing what the other chiefs have been doing, namely, take your program book and discuss them by item the various projects that appear in the program book. I think it makes a very much more valuable statement and is easier to read.

Mr. HAWLEY. Beginning with item 247 and continuing down to item 253, there are some appropriations by districts in addition to appropriations for forests. I would like to have the Chief Forester, if he would, enter upon the record, so that we may have it on the

door of the House and for other purposes, how that money is expended.

The CHAIRMAN. Is that in the statement you submit here, Doctor?

Mr. GRAVES. No, sir; I only gave the changes in the individual forests.

Mr. HAUGEN. Let the statement show why this money is needed for the different forest districts.

The CHAIRMAN. Yes; for that, please.

Mr. GRAVES. The administration of the national forests is decentralized as much as possible. We have not only local supervisors in charge of each forest unit to whom are given as much direct responsibility as possible, but we have established district headquarters in seven districts, each in charge of the group of forests within the district. The general supervision, direction, and inspection of the forest work is carried on from the district headquarters. It is a part of the system of decentralization of the administrative work. We aim to have as much of the business transacted in the field as possible and as little of the detail and routine work to come to Washington as possible, in the interest of prompt transaction of business and the convenience of those who do business with the Forest Service.

In each one of these districts is a district forester, assisted by a group of men specialists in different lines of work, including specialists in grazing, in lumbering, fire protective work, lands work, etc. The inspection work on the national forests along different lines is carried on from the district offices. In addition, there is a good deal of work concentrated in the district offices, such as the accounts. There is a fiscal agent in each district office who is a disbursing officer, disbursing for the salaries and other expenditures involved in the district. There is also a law officer in each one of the districts. Then there are concentrated certain processes such as the drafting, making of maps, stenographic work, and so on, so far as that can be done more economically at one point than if scattered in the different forests. The item for the District of Columbia, No. 994, applies to the general administration of the whole Forest Service and to the work of administration, direction, and inspection of all of the national forests work of the country. The expenses of my own office, Mr. Potter's office, and of the different assistant foresters in charge of silviculture, grazing, and so forth, come under that item.

Mr. HAUGEN. Mr. Chairman, I have looked through these detailed estimates, beginning on page 156, under the various items of expenditure, beginning on page 151, showing how the money is expended, but in these seven or eight items I find no such detailed statement. There appears to be a combined statement, but these are pretty large lump-sum items, upon which the committee has no detailed statement.

Mr. GRAVES. I have that in full detail in my allotment books here, from which they can very easily be transcribed.

The CHAIRMAN. I think it would be very well to have that for the record, Mr. Graves, if it does not take too much trouble.

The statement referred to follows:)

ement showing, by national-forest districts and for the District of Columbia, oposed expenditures for general administration from lump-fund appropri- ions for the fiscal year 1917.

NATIONAL FOREST DISTRICT NO. 1.

ries		$43,644
As follows:		
Out of Washington—		
1 district forester	$3,200	
1 assistant district forester	2,800	
1 assistant district forester	2,600	
1 assistant district forester	2,500	
1 assistant district forester	2,400	
1 district engineer	2,600	
1 logging engineer (4 months)	2,600	
1 civil engineer	2,000	
1 civil engineer	1,500	
1 lumberman	2,500	
1 lumberman	2,000	
1 lumberman	1,800	
1 mineral examiner	2,100	
1 mineral examiner	2,000	
1 claims examiner	1,700	
1 forest examiner	1,600	
1 forest examiner	1,500	
1 forest examiner (9 months)	1,500	
1 forest examiner	1,400	
1 national forest examiner	1,800	
1 grazing assistant (6 months)	1,200	
1 forest assistant	1,100	
1 clerk (temporary)	1,200	
1 clerk (6 months)	900	
eling expenses		15,900
ellaneous expenses		4,556
Total		64,100

NATIONAL FOREST DISTRICT NO. 2.

ries		$30,810
As follows:		
Out of Washington—		
1 district forester	$3,200	
1 assistant district forester	2,800	
2 assistant district foresters, each	2,700	
1 assistant district forester	2,500	
1 district engineer	2,400	
1 lumberman	2,000	
1 forest examiner	1,700	
1 forest examiner	1,600	
1 forest examiner	1,500	
1 national forest examiner	1,900	
1 grazing examiner (6 months)	1,600	
1 surveyor	2,000	
1 surveyor-draftsman	1,500	
1 blue printer (temporary)	720	
1 telephone operator (temporary)	600	
1 clerk (6 months)	900	
eling expenses		12,150
lies and equipment		400
ellaneous expenses		5,040
Total		48,400

NATIONAL FOREST DISTRICT NO. 2.

Salaries		$70,120
As follows:		
Out of Washington—		
1 district forester	$3,000	
1 assistant district forester, each	1,700	
1 assistant district forester	1,600	
1 inspector of grazing	1,400	
1 inspector of grazing	1,800	
1 lumberman	1,800	
1 forest examiner	1,400	
1 forest examiner	1,400	
1 forest examiner	1,500	
1 forest examiner	1,700	
2 forest examiners, each	1,600	
1 forest examiner	1,500	
1 national forest examiner	1,500	
1 grazing examiner (6 months)	900	
2 rodmen, junior grade, each	540	
1 rodman, junior grade	720	
1 [illegible]	900	
Traveling expenses		12,250
Supplies and equipment		150
Miscellaneous expenses		5,980
Total		88,500

NATIONAL FOREST DISTRICT NO. 4.

Salaries		$37,510
As follows		
Out of Washington		
1 district forester	$3,200	
4 assistant district foresters (each)	2,700	
1 district engineer	2,400	
1 logging engineer	2,400	
1 inspector of grazing	2,400	
1 lumberman	1,800	
1 forest examiner	1,500	
1 forest examiner (six months)	1,500	
1 forest examiner	1,400	
1 national forest examiner	1,800	
1 national forest examiner	1,600	
1 national forest examiner	1,400	
1 scaler	1,400	
2 draftsmen (temporary), each	900	
1 blue printer (temporary)	720	
1 unskilled laborer (temporary)	540	
Traveling expenses		10,850
Miscellaneous expenses		4,040
Total		50,400

NATIONAL FOREST DISTRICT NO. 5.

Salaries		$45,850
As follows:		
Out of Washington—		
1 district forester	$3,200	
3 assistant district foresters, each	2,700	
1 assistant district forester	2,400	
1 district engineers	2,700	
1 junior engineer	1,400	
1 lumberman	2,500	
1 [illegible]n	2,000	
1 [illegible] examiner	1,800	

es—Continued.		
s follows:		
Out of Washington—Continued.		
1 forest examiner	$2,400	
1 forest examiner	1,800	
1 forest examiner	1,700	
1 forest examiner	1,500	
2 national forest examiners, each	2,000	
1 national forest examiner	1,800	
1 national forest examiner	1,600	
1 national forest examiner	1,400	
1 grazing examiner (six months)	1,200	
1 scaler (eight months)	1,500	
1 forest ranger (eight months)	1,300	
1 blue printer (temporary)	720	
1 clerk (temporary)	1,100	
2 clerks (temporary), each	900	
1 messenger boy (temporary)	360	
ling expenses		$14,775
ies and equipment		1,150
llaneous expenses		8,325
Total		70,100

NATIONAL FOREST DISTRICT NO. 6.

es		$43,556
s follows:		
Out of Washington—		
1 district forester	$3,200	
3 assistant district foresters, each	2,700	
1 assistant district forester	2,600	
1 district engineer	2,400	
1 logging engineer	2,800	
1 logging engineer	2,500	
1 lumberman	2,500	
1 lumberman (9 months)	2,000	
2 lumbermen, each	1,800	
1 topographer	1,800	
1 mineral examiner	1,800	
1 forest examiner	2,200	
1 forest examiner	1,800	
1 forest examiner	1,500	
1 national-forest examiner	1,600	
1 forest assistant	1,200	
2 forest assistants, each	12	
1 surveyor-draftsman	1,400	
1 clerk (temporary)	1,020	
1 collaborator	12	
ling expenses		12,000
ies and equipment		300
llaneous expenses		5,544
Total		61,400

NATIONAL FOREST DISTRICT NO. 7.

les		$11,550
s follows:		
In Washington—		
1 assistant forester	$3,750	
1 assistant district forester	3,000	
1 assistant district forester	2,300	
1 forest inspector	2,500	
ling expenses		2,500
llaneous expenses		850
Total		14,900

DISTRICT OF COLUMBIA.

[illegible]		$66,150
[illegible]	$4,000	
[illegible]	3,750	
[illegible]	3,500	
[illegible]	3,000	
[illegible]	3,000	
[illegible]	2,880	
[illegible]	2,760	
[illegible]	2,880	
[illegible]	3,750	
[illegible]	2,000	
[illegible]	2,880	
[illegible]	1,440	
[illegible]	3,500	
[illegible]	3,000	
[illegible]	2,400	
[illegible]	2,200	
[illegible]	2,000	
[illegible]	2,200	
[illegible]	900	
[illegible]	900	
[illegible]	1,440	
[illegible]		35,750
[illegible]		3,000
[illegible]		22,830
[illegible]		127,730

The CHAIRMAN. I notice, on page 239 of the Program of Work, that you seem to be a detailed statement there of how you expect to expend this fund in these various districts during the current fiscal year. Am I correct in that?

Mr. GRAVES. I think that includes also the statutory roll. It is not the item that he was asking about.

The CHAIRMAN. Then, this page 239 represents a combination of these totals here and the statutory rolls?

Mr. GRAVES. Yes. This Program of Work includes the statutory roll; it also includes the proposed expenditures from different items of appropriation. The Program of Work, made up in conformity with the general policy of the department, works differently in presenting estimates for national-forest administration and in presenting estimates for investigational work. In some instances there may be represented in a single item of proposed expenditure here 170 different items of appropriations contributing to it, in addition to the different individuals on the statutory roll. This Program of Work, so far as administration of the national forests is concerned, takes into consideration the distribution of the time of the different employees of the Forest Service. It is really based on our system of cost keeping, which shows the cost of different work in accordance with the amount of time spent on a given line of work by a forest officer. A single ranger may, in a given month, be engaged on 15 or 20 different lines of work. The whole staff of rangers on a given forest may, during the month, be engaged on 30 or 40 different lines of work; and, in presenting these and combining them into a statement of estimates according to the department Program of Work, a given item may represent only a part of the time of a given forest officer, while the rest of his time is included in several other items.

The CHAIRMAN. Yes; I can appreciate that. I think, Doctor, if ou will take up your program book at page 212 and discuss first ery briefly your item for general administration, just what that in a eneral way covers, that will be the best way to proceed.

Mr. GRAVES. This item includes my own personal staff, consisting f two high-grade assistants in my office and the clerical force. It ıcludes the salaries and expenses of each of the district foresters in ıe seven districts, with their immediate staffs, clerical help, and :aveling expenses. The aggregate here, estimated as $69,946, comes rom the eight items for general administration, Nos. 247 to 254, ıclusive—eight different items of appropriation; and the remarks made a few moments ago about our general organization would xplain the distribution of the expenditures.

The CHAIRMAN. Then your law work, Doctor; briefly, what is ontained under that?

Mr. GRAVES. There is detailed from the solicitor's office one law fficer to my office here and one to each of the district offices. They re paid from the statutory roll of the solicitor's office. They are etailed to our work. The items of proposed expenditure represent he cost of their assistants, clerical force, and traveling and other ıcidental expenses. In short, their salaries are paid from the olicitor's office and their expenses from the funds of the Forest ervice.

The CHAIRMAN. Most of these men are stationed in the field?

Mr. GRAVES. One of these officers is stationed at each one of the istricts.

The CHAIRMAN. And how many have you here in Washington?

Mr. GRAVES. There is one officer detailed here in Washington to ıe Forest Service.

The CHAIRMAN. All right. You have a Division of Accounts here. presume we all know in a general way what that is.

Your editorial work, Doctor, involves rather a large sum, it seems) me. Just what do you say of that?

Mr. GRAVES. The editorial project in the Program comprises all ıe different work connected with our publications—distribution of ublications, review of publications, and all of the work of educa- on and information carried on by the Forest Service. It includes ıe work connected with such exhibit work as we do, in accordance ith the general plans of the department. Mr. Smith, who has ıarge of that work, is here.

The CHAIRMAN. Suppose, Mr. Smith, that you make us a five- inute explanation of this item.

STATEMENT OF MR. HERBERT A. SMITH, EDITOR, FOREST SERVICE.

Mr. SMITH. Mr. Chairman, the work of the editor's office comprises group of activities which have to do, directly or indirectly, with ıe diffusion of information. Some of them actually do the work, hile others are auxiliary to doing the work. The most important nd the most costly of these activities is that which we call review, lthough the word "review" is not precisely descriptive of all the ork included. The major part of it is the review of manuscripts

[illegible] This reviewing in the Forest Service is [illegible] The point is to get men who are qualified to [illegible] qualified also to put it into the best possible [illegible] having been laid in the publication work of the Forest Service in making those publications which are intended for general [illegible] as simple and effective as possible.

The [illegible] are also to some extent originating [illegible] they produce occasionally original publications. For instance, some [illegible] which were distributed at San Francisco in connection with our exhibit at the exposition, on Government forest work and the country's timber supply, were originated by [illegible] This work costs about $7,000 a year, [illegible] work.

The CHAIRMAN. Mr. Smith, are the men doing this work paid out of this fund here, or are they carried on your statutory roll?

Mr. SMITH. They are carried on the miscellaneous roll of the Forest Service.

The CHAIRMAN. They are the men doing the scientific work?

Mr. SMITH. Yes, sir. The clerical work I spoke of is carried on the statutory roll.

The CHAIRMAN. How many of these men have you doing this review work?

Mr. SMITH. Three can are provided for.

The CHAIRMAN. What are their salaries?

Mr. SMITH. One at $2,400 and two at $2,000 each.

The CHAIRMAN. You also pay their traveling expenses and other necessary expenses connected with your work?

Mr. SMITH. Yes, sir.

The CHAIRMAN. Now, that takes up about $7,000. What do you do with the balance of that fund?

Mr. SMITH. The next division of the work which I should like to speak of is that which we call printing. That relates chiefly to proofs and forms. We have a very large number of forms in the service and, as revisions of them are frequently called for to keep them up to date, the work in connection with them takes a great deal of time. In revising they must be put in the best possible form, from a printing standpoint, and seen through the press; and the same sort of work is involved in connection with all publications. That takes about $6,000 altogether for the work in connection with the printing, as distinguished from the review work. Then, in addition, there is $3,000 more for what I might call a document and folding room. This does not mean that we duplicate in any respect the work that is done in the departmental division of publications or the provisions made for handling publications from the Government Printing Office. We have, however, occasion to keep a small stock of publications and to handle the forms and also our administrative handbooks and things of that kind, which includes their distribution to our own field force as well as maintaining the stock that is needed in the Washington office for use in correspondence. We have also a stapling machine and a man to operate it. It is used in getting out mimeograph material for any line of work in the Washington office. The material is brought to us for assembling, stapling, folding, and mailing. There is also the writing of addresses. This takes about

)00 more altogether. Therefore the printing, with this auxiliary rk, makes up about $9,000 additional to the $7,000 I have already ken of.

The CHAIRMAN. And what is your other line, Doctor, that takes the balance?

Mr. SMITH. The next is that which we call the educational and ibit work. "Educational" means the handling of material which alled for by school-teachers and others engaged in work of public ication and the correspondence connected with the use of this terial. We have a few small traveling exhibits of woods, and traveling exhibits of photographs, which are in great demand. also have very many calls for lantern slides by people who wish give lectures, both school-teachers and others. Work of this kind s in the field of what we call education.

The CHAIRMAN. Do you give these slides or do you just lend them?

Mr. SMITH. We lend the slides. The slides are routed out and go m one person to another, to be gone for a number of weeks, and same way with the traveling exhibits I spoke of. A great deal correspondence is necessary also.

The CHAIRMAN. Do you pay the freight cost of the lantern slides?

Mr. SMITH. No; each individual pays the express from one place another, unless the slides are sent, of course, for the use of our n people.

Mr. MCLAUGHLIN. I suggested a year ago to increase this appro- ation for educational work and cooperative work with the schools.

Mr. GRAVES. It was your thought, I believe, to give us not only an rease in appropriation but more authority to deal directly with ool-teachers and furnish school-teachers with proper statements l circulars which they could use in the schools.

The CHAIRMAN. You do not think that they have that authority v?

Mr. GRAVES. No; as I understand it, we do not have the authority furnish printed material for school use, which would be substan- ly textbooks.

The CHAIRMAN. You do not have the authority to print the ordi- y farmers' bulletins?

Mr. GRAVES. Yes; farmers' bulletins, for the use of farmers; but vas speaking of handbooks and similar matter for educational itutions. I think I am right in that, Mr. Smith?

Mr. SMITH. We can print any ordinary information, and we have ietimes printed circulars which were intended particularly for the stance of teachers. When it comes to printing for distribution the schools, I do not know what the particular point is that is olved, but it occurs to me that the demand along this line will be reat that it will, perhaps, be difficult to secure the printing funds.

Mr. MCLAUGHLIN. I do not think it was a question of printing.

Mr. GRAVES. I think what you had in mind was the circulation of ulars on elementary forestry which could be used by school- hers in their instruction work.

Mr. HAWLEY. You have two such farmers' bulletins on the subject forestry?

Mr. GRAVES. Yes; that is good so far as it goes. That covers only phase of the possible educational work.

Mr. [illegible]. There was some kind of cooperative work that the schools wanted to carry on. I do not recall now just the nature of it, but it seems to me the wording suggested included [illegible]. Do you recall that?

Mr. [illegible]. We thought we that there would be some [illegible] from the schools to the different schools and [illegible] to secure materials for their use.

[illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]. We have a cooperative work, but we do not carry it [illegible] in mind last year. We [illegible] the need to have some further [illegible] the schools and the teachers.

Mr. [illegible]

Mr. [illegible]. I think the schools, so far as I [illegible] to get exactly that help. I think Mr. [illegible] of this demand is made several years ago. [illegible] the Central West—in Iowa, was it, that [illegible] particularly brought up?

Mr. Swain. Yes; there was marked demand from Iowa. There has been [illegible] work of this kind from the schools—many times greater than it is possible for us to accept. They want to teach forestry. There is a call for publications; there is a call also for assistance, for people to go to talk to the teachers. I think a very interesting matter in connection with that is the call that seems to be developing in some parts of the West, especially in California, for help to schools, because of the very definite and practical interest of the people locally in various questions of forestry, and, for one thing, in connection with forest fires and their prevention. To the district forester this matter naturally presents itself as a matter of a great deal of importance, for the greater the interest in the matter and the more the opportunity to get at this thing in the schools is taken advantage of the less money he will have to spend in protecting the forests, because the stronger will be the public sentiment against forest fires.

Mr. Howell. Some years ago the Forest Service thought it advisable to have some of their rangers take a winter course for their better equipment in the duties of their office, but I think that was discontinued, because it was held that they had no authority to do that. Don't you think it would be a good idea to have an appropriation made by which your rangers could take a winter course in some educational institution and thereby better equip themselves for the duties of a forester?

Mr. Graves. I think it would be exceedingly desirable, if we had authority and funds, to extend the training of our ranger force. In some cases I think it would be better for us to hold our own camps and give our own instruction in the field than to have the men go to the regular forest schools.

Mr. Howell. Are you doing any work along that line at the present time?

Mr. Graves. We encourage rangers to go at their own expense to these institutions which are in existence, but we are not sending them at the expense of the Government.

The CHAIRMAN. Mr. Smith, does that about complete the line of work in which you are in charge?

Mr. SMITH. Not quite, sir.

The CHAIRMAN. All right, sir.

Mr. SMITH. In connection with that educational work and exhibits, I did not speak of the exhibit work. This includes both the development and the use of exhibit material. It is displayed not only in expositions, but is used also a great deal in small displays of one kind and another. These include State and county fairs and many other opportunities for the use of this material, where the organization concerned pays the expenses of the transportation, but we have to get the material out of storage, of course, after planning what can be sent, and get it off and get it back again. That is the work of education and exhibits. Connected with it is the lantern-slide collection and the coloring of new lantern slides. The exhibition and educational work costs about $6,000 and the lantern-slide collection and the development of lantern slides about $3,000 more. Then there is the service photograph collection, which, although maintained for the general use of the service, is largely used for illustrative purposes, and so happens to have been placed also in the office of the editor. This adds another thousand dollars, speaking roundly. Then there is the cost of my own office, which provides for the general supervision and the information work.

The CHAIRMAN. We are very much obliged to you, Mr. Smith.

STATEMENT OF MR. JAMES B. ADAMS, ASSISTANT FORESTER, FOREST SERVICE.

Mr. HAWLEY. On the item of accounts, Mr. Chairman, I think there ought to be something said on that. About 2.7 per cent of the entire appropriation is used in keeping the accounts; that is, $1 out of every $37 is used in keeping the accounts, which seems to me to be a pretty high accounting cost. There is probably a reason for it, but I think it ought to be stated.

The CHAIRMAN. Dr. Graves, can you state it or furnish some one who can?

Mr. GRAVES. In addition to the ordinary accounting, we are also keeping track of the actual cost of our different lines of work, our different activities in determining unit costs, as an administrative check. The expenses connected with the fiscal agent's office I have gone into a number of times, and they do not seem to be at all excessive. We have felt it was very necessary in the transaction of this business enterprise to have a good accounting system, to know just where our money goes, and also a cost-keeping system as an administrative check as well. I do not know, Capt. Adams, whether you can add anything to that. You are more familiar with the accounting work than I am.

Mr. ADAMS. Mr. Hawley's calculation must be in error. The cost of accounting, as shown in the Program of Work, represents much less than 2.7 per cent; but, even if it did come somewhere near it, the amount in the estimate is the least for which the work can be done. It is necessary to keep the accounts in the way in which they are kept to meet the requirements of law. I believe the service would

be made to make the reports required by Congress at any less expenditure.

Mr. [illegible]. Two and seven-tenths per cent on the cost of the business of an institution is a very high accounting cost; that is, your explanation would be that you have a multiplicity of accounts to keep?

Mr. GRAVES. Yes, sir; and, furthermore, this item of accounting covers the handling of appointments, which involves quite a large amount of work—far more than would be required in any private concern. In comparing Government expenditures with those of private concerns it should be borne in mind that we are compelled to observe many laws, civil-service rules, and departmental regulations which force us to do a very large amount of work that no private concern is required to do. It is hardly fair to the Government to compare Government costs with costs in private concerns in this kind of work. There is a very large amount of administrative cost keeping which is necessary if we are going to be able to make these reports to Congress in the manner prescribed and keep track of the unit cost of work performed by different units of the organization and by different individuals, so that we can compare them and detect instances of inefficiency. The records of unit costs furnish the basis in a large measure for the inspection work of the service. The proposed expenditure for accounting covers the auditing of all vouchers, the actual disbursement of funds appropriated, the keeping of allotment-control accounts, activity and project cost keeping, and the maintenance of appointment records. On the basis of the total amount appropriated the cost would be only a little over 1 per cent, but if the total amount of the receipts is included the percentage of cost is less than 1 per cent.

The CHAIRMAN. Is that all, Mr. Hawley?

Mr. HAWLEY. I understand from Capt. Adams that this cost accounting covers the entire appropriation for the Forest Service, and on that basis the cost accounting is 1.55 per cent of the whole amount. I based the percentage first stated on the figures given at this place.

Mr. GRAVES. Mr. Chairman, I think perhaps I did not make myself quite clear under the head of the law work regarding our organization. In my explanation I had in mind the different officers of the legal department who were assigned directly to the offices of the Forest Service. Mr. Williams, of the Solicitor's office, is the head of a section of forest law work, and he has his organization in the Solicitor's office itself, in addition to those men whom I have mentioned. I would like to mention further that in this item under law work is included the expenses of an office of appeals in the Secretary's office—appeals which are made from decisions of the Forest Service to the Secretary. This is an office to help him in handling those cases.

The CHAIRMAN. Now, then, Doctor, take the next item, supply depot and property audit, $126,280. What is that?

Mr. GRAVES. I will ask Capt. Adams to handle that, as it comes under his direct charge.

Mr. ADAMS. Mr. Chairman, this item of $126,280 covers the expenses of maintaining the Ogden supply depot and the office of the

property auditor at Ogden. The total proposed expenditure for the supply depot is $120,000 and for the property auditor's office $6,000. The $120,000 for the supply depot is divided into $96,000 for purchases, $10,000 for freight and other transportation expenses, $4,000 for rent and other depot expenses, and $16,000 for statutory salaries.

The CHAIRMAN. Briefly, what do you call necessary supplies, instruments, and so on?

Mr. ADAMS. Out of this $96,000, field equipment costs approximately $33,000, instruments approximately $10,000, furniture approximately $16,000, and stationery and other office supplies approximately $37,000.

The CHAIRMAN. Furniture—what do you mean by that?

Mr. ADAMS. Furniture for all rangers, supervisors, and district offices.

The CHAIRMAN. What do you mean by furniture?

Mr. ADAMS. Desks, tables, etc. It is not, as a rule, additional furniture, but mainly replacement. We have several hundred thousand dollars' worth of furniture in use in the numerous offices of the service, and, of course, there is annual depreciation and replacement, and this item for furniture, $16,000, is mainly for that purpose.

The CHAIRMAN. What is the character of your instruments, Doctor? What are they for?

Mr. ADAMS. They are used by the technical men in carrying on their work, such as compasses, callipers, marking hatchets.

The CHAIRMAN. And things of that kind?

Mr. ADAMS. Yes, sir. Barometers and hypsometers, levels.

The CHAIRMAN. Such things as shovels and axes?

Mr. ADAMS. Such things as shovels and axes, sir, come under the head of field equipment, which includes such articles as bags—water bags and canvas bags for fire fighters—canteens, flags, knapsacks, canvas-carrying cases, locks, signs, snowshoes, tally registers, tentage, etc.

The CHAIRMAN. These are paid for out of this fund?

Mr. ADAMS. Yes, sir. In addition to this, there are other items of expense for supplies, which are not included in this $126,000. They show elsewhere, I believe, in this program of work, but they also are paid from the $152,000 appropriation for the purchase of supplies.

Mr. MCLAUGHLIN. Many houses are built for the rangers in the forests. Are they furnished also?

Mr. ADAMS. No, sir. There is no furniture supplied to any of the houses built for the use of the forest officers, except in a few instances where shacks are located in remote places for the accommodation of transient forest officers. These are in the nature of permanent camps. In such cases bunks and cots, and in some cases blankets, as well as simple cooking utensils, are supplied, but no attempt is made at house furnishing.

Mr. HOWELL. How is the purchase of these various supplies conducted?

Mr. ADAMS. Under annual contracts awarded by the Secretary; under the same regulations that apply to the purchase of supplies and equipment throughout the entire department.

STATEMENT OF MR. A. S. PECK, FOREST INSPECTOR, FOREST SERVICE.

The CHAIRMAN. Your next project is protection and administration of the national forests. Take up the first item there of supervision and tell us in a general way what is being done.

Mr. GRAVES. This item covers the chief work of the permanent force on the forests, the supervisors and rangers. It covers the greater part of the time of the ranger—that is, that part of the rangers' time which is not represented under specialized lines of work, such as trails, telephones, and so on, which follow later in the program.

The largest item of expenditure is protection of the national forests. Our most immediate problem in organizing and administering the forests is protection against fire, and that is work about whose progress perhaps you will be interested in knowing. It has been necessary to inaugurate a system of protection on areas which previously were not protected in any way and on which there were for the most part not even means of communication. The basis of our protective work is to develop systems of trails and telephone lines, means of communication, lookout points for detecting fires, and other improvements, such as the building of rangers' stations at points in forests where the rangers should be located to the best advantage for the protection of the district in his charge. The item for improvements is given a little later in here, so I won't speak of that now. The second necessity in the protection of the forests is to have an adequate force on the ground to prevent fires from starting and to quickly detect fires which do start. If it will interest the committee, it might be well to point out on one of our fire-plan maps the system of protecting a forest. Mr. Peck, who has charge of this fire work in my office, will explain from the map the different matters of interest.

Mr. PECK. Mr. Chairman, lookout stations are first selected at prominent topographical points in the forests with the idea of covering the entire area of timbered lands with a complete system; for instance, at each of these points [indicating] is a lookout station. In this case the country is rather level and we have to build towers varying from 50 to 125 feet in height. At each of these towers is located an observer, who is there continually throughout the day. He is equipped with a map and with a compass or a sighting arrangement with a graduated circle commonly known as an alidade. He watches out for any smoke that he can see and telephones the location or the bearing of that smoke to the supervisor's headquarters, located at a central point. The supervisor then calls up another lookout station and gets the bearing from that point. For instance, the observer at this point [indicating] reports a fire at about 330. The supervisor goes to this map on the wall and pulls out this thread and gets the direction of the fire from that point. Then he gets similar information from the lookout observer at this point [indicating] and does the same thing. The intersection of the two strings gives him accurately the location of the fire. He then knows from his prearranged fire plan exactly what action to take and who is the nearest man to go to the fire.

At various points throughout the forests are located tool boxes which fire-fighting tools are stored, and we also have firemen or

"smoke chasers" located at strategic points with relation to the regions of highest hazard and the most valuable stands of timber, who are on instant call from the supervisor's office to go to fires. The intention is to attack the fires when they are small. We count the fight successful when we keep the fire within a 10-acre limit. It is obviously desirable to attack them when they are small, for the expense mounts up very rapidly if they escape and become larger, requiring a large force of volunteer fire fighters. Our success in this is shown very well by the fact that only 20 per cent of the fires exceed 10 acres in area.

Mr. McLAUGHLIN. What is the area of this, and what are the distances between the points indicated there on that map?

Mr. PECK. It depends entirely upon the topography and the distance which an observer can see. In this particular case they vary from 20 to 35 miles, and in some cases 40 miles. Very often there are 20 to 30 miles between two lookout points, and we have had cases where fires have been picked up at 50 miles. On Mount Hood last summer fires were sighted as far as 60 or 70 miles away. That is one of the most notable cases of the use of lookouts that we have. It is, in a way, very interesting, because it is a high mountain, relatively speaking—11,225 feet—and that is rather high in the Cascades. It is a snow-capped mountain, and during the past year we had an expert mountaineer on the top of that mountain, keeping himself warm with an oil stove, and he picked up a great many fires which could not be seen by other observers located at lower altitudes and nearer to the fires. It was a rather unlooked-for development and one which interested us very much.

Mr. McLAUGHLIN. What do you mean by being continually on guard?

Mr. PECK. We mean absolutely that. On a great many lookout points, where it is not necessary to use a tower, we have a glass-bound house. There is a row of glass windows almost entirely surrounding the house about 4½ feet from the floor. The lookout not only uses that as an office but as living quarters. It is equipped with a bunk and a stove, and so on, and a table mounted in the center, upon which are his maps and his instruments, and he is there day and night. Last year on one of the California forests an observer picked up a fire just as he was cooking his supper—we hire his eyes—and as a result of that the ranger by making a night ride reached the fire early in the morning, about 5 o'clock, when he put it out with little difficulty, averting the danger of a large fire. Another observer picked up a fire by the glare at 2 a. m., and the same result was accomplished.

Mr. HAWLEY. Do you have very many night-started fires?

Mr. PECK. No; except during lightning storms.

The CHAIRMAN. How does your forestry area compare with what it was last year? Have there been very many eliminations?

Mr. PECK. There have been considerable eliminations this year.

Mr. GRAVES. Perhaps that had better be discussed under the head of lands, where that is gone into in some detail.

The CHAIRMAN. Was this a bad fire season?

Mr. PECK. This past fire season was very peculiar, and it really subjected our forces in the northwest particularly to an unusual

[illegible] season was this, that while it began [illegible] spring and early summer was it [illegible] the fall. In Oregon and Washington [illegible] we had 80 per cent of the timber loss [illegible] of the total number of fires, the season [illegible] long in August, and in September [illegible] had in all previous Septembers on [illegible] over by the middle of septem- [illegible] compared very favorably with that of [illegible] the relative number of fires. In the [illegible] expenditures were $700,000, as against [illegible] yards, with 71 per cent of the num- [illegible] 30 per cent of the 1914 cost. [illegible] last year as compared with other [illegible] are improving your fire-fighting [illegible]

[illegible] which is almost negligible [illegible] threatened and saved, which would [illegible] In 1914 we had about 7,000 fires, as [illegible] the past year, but year before last the [illegible] early in the year when the days were [illegible] our losses were somewhat heavier. [illegible] $1,000 worth of timber, young growth, and [illegible] in spite of the very severe fire season, as against $250,000 [illegible] The losses fluctuate year by year and, while the weather con- [illegible] undoubtedly have much to do with determining them, we fee that we have made distinct progress in our system of attacking fire [illegible] Of course, a part of that is due to the fact that ou communication systems have been wonderfully developed in the la two years. We now have 22,000 miles of trail and 2,500 miles of roa that have been built by the service, and 20,000 miles of telephone line and of course a system such as I have described here is vitally d pendent upon facilities for quick communication.

Mr. McLAUGHLIN. You spoke of loss of timber and forage. I ca see very well how you could estimate the loss of timber, but how c you estimate the value of the forage? How do you estimate a fora loss?

Mr. PECK. It is based upon the loss of time during the grazi season, the loss of the forage which might have been eaten if it h not burned. Naturally, the loss is not permanent as in the case timber; that is, the grass grows again, but there is a definite lo during a given grazing season. We computed it on that basis.

Mr. McLAUGHLIN. How do you calculate it?

Mr. PECK. Simply by the number of head of stock that might ha grazed.

Mr. McLAUGHLIN. Suppose there were no stock there?

Mr. PECK. The forage is burned whether the stock is there or no as a matter of fact, however, most of the forests are fully stocked.

The CHAIRMAN. That is a loss that does not hurt anybody.

Mr. McLAUGHLIN. And you include that amount of loss in yo estimates of the amount of loss by fire?

Mr. PECK. Theoretically, perhaps; but it is practically all in g ground, if reported. Besides, the entire forage loss is trifling amount. The largest loss is in the timber. We also include loss

reproduction; that is, the young timber, which has a prospective but very little present commercial value. But the total figure is very largely made up of timber. Then, of course, the timber is not a total loss, for very often there is merchantable timber remaining after the fire. It has been killed but is still merchantable.

Mr. McLAUGHLIN. If it can be cut at once there is little, if any, loss?

Mr. PECK. We discount that.

Mr. GRAVES. May I add in that connection that in 1910 we had our first big test of the organization in fire protection. In that year the fires got away from us in the Northwest, and there was a total loss of timber amounting to about $15,000,000. There was almost, if not quite, as severe test in the calendar year 1914, in which timber having a value of upward of $100,000,000 was threatened by the 7,000 fires which Mr. Peck has mentioned. In Montana and Idaho alone not less than $60,000,000 worth of timber was threatened during the season of 1914 by the fires which were actually started and which were finally controlled and extinguished by our organization.

Mr. McLAUGHLIN. And the actual loss was about $1,000,000?

Mr. GRAVES. Without reference to young growth, the actual loss of merchantable timber was, as I recollect, about $300,000, compared with $15,000,000 in 1910, showing that in the year 1914 we were able to master the situation.

There are presented here on three maps three of the national-forest districts, showing by pins the fires which actually started during the year 1914 and which were controlled by our organization. These I have brought up here to enable the committee to visualize perhaps better than by description the condition existing at that time.

The CHAIRMAN. Doctor, can you tell what per cent of these fires were caused by lightning and other causes? I think we once had that in the record, but I do not recall it.

Mr. PECK. In the year 1914, which was fairly typical, railroad locomotives caused about 17 per cent of the fires, while lightning caused 30 per cent. This year there was, for some reason, a very marked decrease in the percentage of railroad fires and quite a pronounced increase in the percentage of lightning fires, I think largely owing to the fact that the season was later and not so dry. Incendiarism can be counted on for not over 7 per cent, and that is decreasing.

Mr. McLAUGHLIN. What do you mean by incendiarism—deliberately started fires?

Mr. PECK. Yes, sir; fires started with malicious intent.

Mr. McLAUGHLIN. You do not include in that fires caused from camping parties?

Mr. PECK. No, sir. Camping as a cause of fires is simply due to the carelessness of the campers, and we do not class the resulting fire as incendiary. Campers are responsible for about 17 per cent, and that has increased somewhat during the past few years, owing to the increasing use of the forests by tourists and city people, particularly since the advent of the automobile.

Mr. McLAUGHLIN. We wished to get into the appropriation bill last year, you will remember, a provision to permit the temporary leasing of the forest lands for summer resorts and for business places. Have you any estimate of the loss by fire by such use as that which has been permitted?

Mr. GRAVES. I think that would be negligible in making [illegible] in the granting of the leases for the occupancy of the land there are [illegible] warning potential, and almost invariably such leases or permits for temporary or for summer homes create the establishment in the forests of persons interested in the protection of their own property, who can be counted on to cooperate with us in fire protection.

Mr. MCLAUGHLIN. I recall that one of the objections on the floor to inserting that provision was that it would endanger the forests.

Mr. PECK. In the end I think it would operate exactly to the contrary.

Mr. LEE. Doctor, you specify the camping places?

Mr. PECK. Where there is a great danger of fire we are endeavoring to concentrate camping places.

Mr. LEE. I remember going through one of the forests, and there were places marked for camping.

Mr. PECK. Yes. For example, where there are a great many people coming into the camping places we try to keep our camp grounds clean, and ask people who go into the camps to clean up and not to leave any inflammable material around when they leave.

The CHAIRMAN. That provision spoken of by Mr. McLaughlin, was not that inserted in the bill?

Mr. PECK. Yes; it was in the bill.

Mr. MCLAUGHLIN. Yes, sir; it was cut out in the House, but was restored in the Senate.

FURTHER STATEMENT OF MR. JAMES B. ADAMS, ASSISTANT FORESTER, FOREST SERVICE.

The CHAIRMAN. I see you have an item called "geography," $123,370.

Mr. GRAVES. May I ask Capt. Adams to present that item?

Mr. ADAMS. Mr. Chairman, geography can be translated as mapping and surveying. The first essential in forest administration is the possession of adequate maps. We are dealing with large areas of land, and it is essential that they be visualized in the minds of the administrative officers who are doing the work. Maps are required in nearly all of the different activities of the forests. In the first place, in protection, you see the value of maps such as the one exhibited here. The ranger, the lookout, and the forest supervisor must all have adequate maps. In timber sales it is necessary to make a map of the sale area. In grazing work the grazing areas are mapped. In all the lands work roads have to be located by survey and then represented on maps. So that surveying and mapping—the graphic presentation of the physical condition of the forests—involves a considerable amount of routine or current work.

The CHAIRMAN. Now, Capt. Adams, is it your hope, some of these days, to correlate the various little maps into one big map?

Mr. ADAMS. It is our constant effort to establish base maps of standard character, so as to obviate, in the course of time, the duplication of mapping.

The CHAIRMAN. I was thinking that this was an appropriation that ought gradually to decrease rather than to stay permanent or increase.

Mr. ADAMS. I can not anticipate, at the present rate of accomplishment, any decrease in it for a number of years. We started the administrative work on the forests with almost a total lack of adequate maps, and on account of lack of both money and force the map work which has been done so far has been confined largely to areas where there is the most pressing need, and there remains a great many areas on these forests which are at present inadequately mapped and which must ultimately be covered.

The CHAIRMAN. I was just about to ask if it would be possible to say in percentages how much of the area has been mapped and how much remains to be mapped. I presume that is pretty hard.

Mr. ADAMS. It is almost impossible to state that, because mapping is of two kinds. One is characterized as extensive and the other intensive. We have a very large percentage of the extensive map work done and a comparatively small part of the intensive map work done. I suppose the difference between the two is readily apparent.

The CHAIRMAN. One is what they call in the soil survey a reconnoissance map, and the other is the detail map.

Mr. ADAMS. Yes, sir.

Mr. HAWLEY. Does this geography cover surveying tracts of land?

Mr. ADAMS. It does not include the actual work of survey on the grounds. That is done, as a rule, by surveyors whose time is charged to some particular project, their time being distributed elsewhere throughout the program of work.

Mr. HAWLEY. If a settler wants a piece of land, the survey is charged to another account?

Mr. ADAMS. Yes. You will find that under the item of survey. But the office of geography brings together and correlates all these scattered projects.

Mr. MCLAUGHLIN. Speaking of that land that the settler wishes and which has to be surveyed and examined, is there any expense in that connection that is charged against the settler?

Mr. ADAMS. No, sir. Under the general law there is authority to do the work without expense to the settler, and the present appropriation bill contains an item of $85,000 providing for the expenses of this work.

Mr. MCLAUGHLIN. He is not required to pay any part of that?

Mr. ADAMS. No, sir.

Mr. HAWLEY. That follows the same practice required with regard to the other public lands?

Mr. ADAMS. It equalizes between the settler on land covered by public-land surveys and one of these settlers on unsurveyed land within the forests on which he enters under the act of June 11, 1906.

Mr. HOWELL. Do you keep at your headquarters a map showing the land which is subject to homesteads, so that any settler wanting to make a home can find out just what land is available for settlement?

Mr. ADAMS. I think, Mr. Howell, we have not as yet completely covered that field, but the work which is being done under the appropriation for general land classification, which is $100,000 for this year, is providing that information, and it is reasonable to expect that in a very few years the information will be available.

Mr. HOWELL. If a settler could not get it at your headquarters, he could not get it in any way, could he?

STATEMENT OF MR. HENRY S. GRAVES, CHIEF OF THE FOREST SERVICE—Continued.

The Chairman. What road do you put in? Do you put in a road such as you would ordinarily?

Mr. Graves. The administrative roads, built primarily for administrative purposes, have been relatively few and cheap, but we are now building some substantial roads from the item of appropriation which makes available 10 per cent of the gross receipts of the forests for road building. These roads probably would average about $2,000 a mile, sometimes more and sometimes less.

Mr. McLaughlin. I suppose a good many of these roads are for your exclusive use. Are not some of them, however, for the general use of the people living in the territory?

Mr. Graves. Most of the roads we are building, and all of those from this item of 10 per cent of the gross forest receipts, are primarily for community development. But they are all in the national forests and serve a great usefulness in opening up new resources and for protection from fire.

The Chairman. I notice in your proposed expenditure for 1915–16 is $750,000. That is made up, I take it, from your $400,000 appropriation and the 10 per cent of the receipts?

Mr. Graves. Yes; and also a small amount of time contributed from statutory positions.

The Chairman. I see.

Mr. Graves. In addition, a good deal of the maintenance can be handled at odd times by the rangers, but the value of their time is not included in that item.

Mr. McLAUGHLIN. I notice, on page 214, under "Improvements," you mention fences. Are many of your grazing lands fenced at your expense?

Mr. GRAVES. That item for fences includes corrals and fences about our ranger stations and also some drift fences. Mr. Potter, will you explain the need for drift fences?

Mr. POTTER. It also includes expenditure for drift fences in some localities where they are needed for proper control of the stock, not only to keep the stock apart on the different ranges, but in some localities to keep them off the areas where the poisonous weeds are, and in such cases we cooperate with the stockmen by assisting them in the construction of these fences. None of this money, however, is used for the construction of an individual fence which would be for the personal benefit of the stockmen. Those are all built at their own expense, but some of the expenses that are needed in the protection and administration of the forests are paid for out of this fund.

Mr. LEE. Dr. Graves, the cost of those trails——

Mr. GRAVES. Speaking of the roads, I said the average good road would cost about $2,000 per mile.

Mr. LEE. And the trails?

Mr. GRAVES. The trails, as I recollect it, cost about $50 a mile.

Mr. ADAMS. Last year's reports show 22,000 miles, which had been constructed at a cost of $1,173,000. That would be a little more than $50. It would be just about $53.

Mr. HOWELL. In the construction of roads do you cooperate with the different States in the expenditure of this 10 per cent?

Mr. GRAVES. Yes, sir. I think, perhaps, if I can call upon Mr. Silcox, the district forester at Missoula, Mont., he can tell you something about that.

Mr. SILCOX. In the expenditure during the past three years of about $100,000 of this 10 per cent, we have exercised supervision over the disbursement of about $490,000 in northern Idaho and Montana. That is, we got directly turned over to us approximately $390,000, compared with our expenditure of $100,000.

Mr. HOWELL. That was expended on the roads of the national forests?

Mr. SILCOX. Yes.

Mr. HOWELL. But those are not public roads but roads for the convenience of national forests?

Mr. SILCOX. They were frequently public roads. The national forests stand as an intervening barrier between the different settled communities, and these roads were in practically all cases connecting links through the mountains connecting up the highway system of the different settlements. In many cases the counties in Montana turn over to us the entire handling of the building of these roads, including surveys and supervision over construction and the handling of the funds.

Mr. HAWLEY. Why did the county turn the money over to you instead of doing the work themselves?

Mr. SILCOX. They turned it over to us simply for concentration. In building roads through the Bitterroot National Forest south of Missoula, the county told us that they would not build the road if it was left to their county engineers. The road cost about $54,000

and the counties of Ravalli and Beaverhead disbursed on our approval about $30,000. They wanted in the interest of economy and efficiency a concentration of the funds, instead of having them controlled by three or four interests. In the particular case mentioned the citizens of the communities interested contributed between $5,000 and $7,000 themselves.

Mr. HOWELL. What part of the appropriation for the construction of roads has been used to open up roads to inaccessible timber in order to make it marketable?

Mr. SILCOX. I can only speak for northern Idaho and Montana. Practically none of the 10 per cent has been used for that purpose. It has all been used for the construction of the links to complete the system of public roads.

Mr. HOWELL. Has any part of the appropriation under this heading been used for this purpose, Mr. Graves?

Mr. GRAVES. Very little, because in the selling of timber the improvements are usually made by the operator and he often needs a railroad.

Mr. HOWELL. But if you had a liberal fund at your disposal, would you not be able to market a great deal more timber than you do now?

Mr. GRAVES. There would be a good many instances where we could, but in a great many cases the bringing of the timber does not require a wagon road but a logging railroad, the construction of a flume, or other special means of transportation.

Mr. HOWELL. Are there not a good many instances in the West where it would be a matter of economy on the part of the Government to construct those roads and open up the timber?

Mr. GRAVES. Without any question, and not only to open up timber but a great many other resources as well. The construction of roads by the Government would open up mineral resources and enable perhaps the operation of a mine which is now impossible. I know of one instance in southern California where the construction of a road would enable us to increase our annual receipts from the forests probably in the long run by at least $10,000.

Mr. HOWELL. But the department has not yet made up its mind to enter upon that program?

Mr. GRAVES. There are a great many short roads which we could build if there was the money available. So far as public roads are concerned, the immediate demand is along the lines which Mr. SILCOX just mentioned—connecting up established routes.

Mr. HOWELL. Would it not be a good idea to bring in a few projects once in a while and see what the attitude of the committee would be in regard to the opening up of these resources?

Mr. HAWLEY. Three or four years ago I favored and brought in a proposition, and I think it had the approval of the department to sell a certain amount of timber at Mount Ashland, in Jackson County. A part of it had been burned over, and the committee at that time was unwilling to authorize the expenditure.

Mr. HOWELL. I know that had been the attitude of the committee, but I thought, perhaps, the reasons were so compelling and convincing that it would change its mind.

Mr. GRAVES. Mr. Greeley, have you in mind any timber sales which could be consummated by the construction of a Government road?

Mr. GREELEY. There are certain specific areas, Mr. Chairman, where the construction of a highway by the Government up an inaccessible river valley, like the North Fork of the Coeur d'Alene River, would make available a number of timber chances. This is a road which the individual operators are hardly prepared to construct themeselves. There are a good many individual cases of that character, where Government construction would undoubtedly aid the development of the national-forest timber.

Mr. LEE. Would it pay to do it?

Mr. GREELEY. It would in time.

Mr. MCLAUGHLIN. You have a large body of timber in northern Arizona which is practically useless.

Mr. GRAVES. That would require the construction of a railroad. There are about 2,000,000,000 feet in that particlar body of timber to which you make reference, of which a billion would be available for sale now.

Mr. MCLAUGHLIN. And it is practically going to waste?

Mr. GRAVES. Until a railroad is constructed it can not be used. And may I add one other point in regard to the handling of this work? I want to say that we are not building up in the Forest Service a separate organization of road engineers, but we are utilizing the talent in the Office of Public Roads. That office is assigning engineers to assist us in this specialized road work. There are now, I believe, five men detailed in different parts of the country from the Office of Public Roads to take charge of the survey of national-forest roads and the construction of those which are approved.

Mr. MCLAUGHLIN. I am impressed with what Mr. Silcox said about the wish of these local people to expend their money, because the work can be done cheaper and in a more satisfactory way. It seems to me that is one example, standing alone, where the Federal Government is building anything cheaper than private interests.

The CHAIRMAN. Either that is true or the folks out there are badly mistaken.

Mr. HOWELL. Perhaps that is the only way that the localities can make the 10 per cent available.

Mr. SILCOX. I think it would largely depend upon the personality of the engineer. The particular engineer that I mention is a man born and raised in that locality, and I think they have especial confidence in that particular man and in his qualifications.

The CHAIRMAN. Take up the next item, silviculture; but it seems to me we are getting away so far from the items in the Book of Estimates that we are probably not getting this in the record in the shape that we want it. Silviculture appears in the Program of Work at this point, and it appears in the Book of Estimates as item 263.

Mr. GRAVES. This Program of Work presents the general activities of the Forest Service, and under administration of the national forests the list of activities is discussed on the basis of cost accounting rather than on the basis of the units of organization and items of appropriation. Perhaps, however, it might be as well to go through these different activities, indicating what the Forest Service does in the national forests.

The CHAIRMAN. I think, probably, if you will take up the items as they appear in the Book of Estimates for this bureau, it would

STATEMENT OF MR. L. A. SHERMAN, ASSISTANT FORESTER, FOREST SERVICE.

Mr. HOWELL. Are not all of the areas classified and eliminated from the forest reserve surveyed?

Mr. SHERMAN. The areas which are classified and listed within the national forests have to be surveyed if they are not already surveyed by the rectangular system. In such cases they must be surveyed by metes and bounds.

Mr. HOWELL. How is the work of surveying these tracts of land within the forest reserve kept up with the work of classification?

Mr. SHERMAN. At the end of this fiscal year we will be very nearly caught up. We have made unexpected progress as the result of the eliminations. It appeared some time ago that we would have a great deal of delay in getting caught up with the work, but by the end of this fiscal year we hope to have every tract surveyed where the entrymen are ready to make final proof; that is, for those who have lived upon the land three years we will have the final entry survey completed by that time.

Mr. HOWELL. Would it not be better to have this appropriation $100,000 for survey and $85,000 for classification?

Mr. SHERMAN. I think not, judging from the way the work is going. We are catching up now the way it is—$100,000 for classification and $85,000 for survey.

Mr. HOWELL. With $100,000 available for classification, it seems to me that those engaged in classification work would continually get ahead of those in the surveying.

Mr. SHERMAN. On account of eliminating the lands along the boundaries, we have been able to catch up. Instead of keeping the lands inside of our boundaries and surveying them out of our appropriations, they are eliminated, and after elimination are surveyed by the General Land Office.

The CHAIRMAN. Anything further, Mr. Sherman, on that item?

Mr. SHERMAN. I have here some examples of the way the work is done, showing the progress we are making. We find that because of the character of land we have to deal with it is unnecessary in many instances to make an accurate survey involving very careful examinations. Where the land is at a high altitude and rough, the very fact of climate frequently settles the matter of classification. Therefore, at the outset we start out with a reconnoissance examination, which results in our picking out the areas where there may possibly be agricultural lands. Within these boundaries the possible agricultural lands are determined. Then a very complete and detailed report is made of those areas, resulting in our eliminating lost motion and concentrating our efforts upon the areas where there is more possibility of securing agriculture lands.

Mr. MCLAUGHLIN. An appropriation was made to enable the Bureau of Plant Industry to cooperate with you and tell you what was good land when it was there, and so on. Have they been working with you?

The CHAIRMAN. The Bureau of Soils.

Mr. SHERMAN. We have men from the Bureau of Soils detailed to this work, and in all of our detailed work we have the assistance of a soil expert from the Bureau of Soils.

The CHAIRMAN. I am not very familiar with the work in the national forests, and I may ask some foolish questions. When you have classified these lands, what do you do with them under this item?

Mr. SHERMAN. After they are classified, if they are so located with reference to the boundaries that we can trim them off, we have a new

[illegible] to the public domain.

[illegible] the agricultural land——

Mr. [illegible] Interior has jurisdiction.

[illegible] segregated something [illegible]

Mr. [illegible] that is the total result of our classifications [illegible] one-half million.

[illegible] that compare with your work of the [illegible]

Mr. SHERMAN. [illegible] so far as the area eliminated is concerned. However, I should state that a great deal of this area [illegible] that was done the year before, although the reports were not [illegible] until this year.

The CHAIRMAN. When you have turned it over to the Land Office, settlement on that tract of land would be regulated under the laws which govern homestead entry, and the like of that?

Mr. SHERMAN. Yes; that is eliminated by presidential proclamation. It is an area within our exterior boundaries, it is then listed with the General Land Office and opened to entry under the forest-homestead law, which has certain provisions in it with respect to the matter. That remains in the national forest, and if it is unsurveyed land we are still charged with the duty of surveying it, so the entryman can make final proof.

The CHAIRMAN. That kind of work would come under item 257?

Mr. SHERMAN. Yes.

The CHAIRMAN. If a survey has never been made of land which you have classified as agricultural within the interior of a forest, this $85,000 is available for the survey of that?

Mr. SHERMAN. For the survey of that; yes, sir. Much of the land, of course, that we classify is already surveyed. The rectangular survey covers a portion of our national forests. If it is already surveyed, and if it is so located that it is not necessary for the Government to retain a right of way across it, then it is opened to entry and no survey is necessary. However, if it is necessary for the Government to retain a right of way across it or any rights in it at all, we must make a metes-and-bounds survey, by which we except from the listing the particular part across which we wish to build a road or on which we wish to build anything. It is a very cumbersome method.

Mr. MCLAUGHLIN. Is your work done in the field or in the city of Washington?

Mr. SHERMAN. My work has been about one-half in the field and one half in the city of Washington.

Mr. HOWELL. Is the classification which is made within the exterior boundaries of the forest reserve made by the rangers or by a person appointed from the Bureau of Soils?

Mr. SHERMAN. The first examination, or reconnoissance, is made by a forest officer.

Mr. HOWELL. And then that is followed by a survey?

Mr. SHERMAN. Yes, sir; by a metes-and-bounds survey.

Mr. HOWELL. And if it is approved it is segregated and surveyed?

Mr. SHERMAN. Yes, sir.

Mr. HOWELL. And then it is subject to homestead entry?
Mr. SHERMAN. Yes, sir.
The CHAIRMAN. And the homesteading goes on under some special law governing the homesteading in the forest, or under the general law?
Mr. SHERMAN. If it remains within the forest it is under the forest homestead law, but its provisions are now little different from the general homestead law. At the time the forest homestead law was passed there was a special provision in it that commutation would not be allowed, but now the commutation privilege of the general homestead law has also been curtailed.
The CHAIRMAN. It also allows the homesteader to take up lands without——
Mr. SHERMAN (interposing). I have here a classification which illustrates the way the work is done. It has resulted in our trimming off several areas around the edges.
The CHAIRMAN. I think you have already covered No. 257, but if you have anything to say about it I will be very glad to have you do it.
Mr. SHERMAN. Under this provision we have covered during the last year about 800 separate homesteads. The average cost of the survey is $92, and the work is progressing now very rapidly, so that we have nearly caught up with the needs of the men who are ready to make final proof.
Mr. MCLAUGHLIN. Is the homestead in that part of the country 160 acres?
Mr. SHERMAN. The homesteads have averaged 113 acres. The homesteads that have been surveyed under this item are within the national forests, of course, and sometimes in the mountains they do not reach the 160-acre limit, so the average has been 113 acres to the homesteader.
Mr. MCLAUGHLIN. And none of the lands included in the national forests would be covered by that law we passed the other day allowing 640-acre homesteads?
Mr. HOWELL. That was only such lands as the Secretary of the Interior would designate as being necessary.
Mr. HAWLEY. He has no authority over the lands of the national forest.

STATEMENT OF MR. HENRY S. GRAVES, CHIEF OF THE FOREST SERVICE—Continued.

The CHAIRMAN. Dr. Graves, will you take up No. 258, for fighting and preventing forest fires. There is no change in the item?
Mr. GRAVES. There is no change in that item. I might say this in that connection, that during the severe season of 1914 we incurred a deficiency of $349,000, which was made up last year in the urgent deficiency bill. This year, with a somewhat less severe season, but, as Mr. Peck pointed out, one involving a very hard test during a portion of the season, we again incurred a deficiency of $57,300, which is included in the urgent deficiency bill recently passed by the House.
The CHAIRMAN. Would you argue from that, Mr. Graves, that this sum here ought to be increased so as to give you a little bit more leeway?

Mr. GRAVES. I think that it should. I think that $150,000 will carry us through during a very favorable season. We had such a season in 1912 and 1913, and we did not need to use the whole amount. I think we spent about $130,000, as near as I can recollect, in each of those seasons. During the past season we had a very comfortable time during the early part of the season, but a very severe time at the end, and the best we could do was to hold the expenditure down to $207,000 under this item, including the deficiency of $57,000.

The CHAIRMAN. All right, sir. Those are questions for the committee to take up later.

Mr. MCLAUGHLIN. How much increase did you say was necessary, if it was necessary to be increased?

Mr. GRAVES. Last year there was another item of $100,000 for fire prevention, in addition to this item, making a total of $250,000, and that was cut out last year in the act for the current year, so that we had only $150,000 to operate on. If we had had the total amount of the previous year, we would not have had any deficiency. I feel, in seasons such as we have had this year, that there should be funds to cover the items so that we would not be obliged to create a deficit.

Mr. HAWLEY. The man who does the work and furnishes the supplies has a just liability against the Government, which will be paid?

Mr. GRAVES. No; the bills are paid.

Mr. HAWLEY. What fund do you pay them from?

Mr. GRAVES. They are drawn from any funds in the Treasury appropriated for the Forest Service, and are charged against this item, so that if this $57,000 was not made up this year by deficiency appropriation it would have to come from funds of the Forest Service, and we would have to stop work toward the end of the year long enough to cover the deficiency.

The CHAIRMAN. That deficiency, then, must come out of the Treasury?

Mr. HAUGEN. You can not estimate the amount. It is just as likely to be a million as a hundred thousand.

Mr. GRAVES. It is now so that we can estimate the number of fires that occur in an average year—the average hazards that we are likely to have under normal condition—because we have the statistics for a good many years. It is my belief that in the average year it would cost us more than $150,000.

Mr. HAUGEN. If you had a dry year next year you would be as likely to need a million dollars?

Mr. GRAVES. I believe that we have shown in the year 1914 and this last year that we would not have to spend a million dollars.

Mr. HOWELL. Your position for fighting a fire is so much better?

Mr. GRAVES. Yes, sir; and we have many thousands of miles of telephone lines and trails and other improvements, so that we are in better position than we ever have been to successfully fight the fires.

The CHAIRMAN. Doctor, take up No. 259, and when you finish that I will ask the committee to take a recess.

Mr. GRAVES. That is the matter which Mr. Adams took up.

The CHAIRMAN. Then take up the next one, No. 260, "for investigations of methods of wood distillation and for the preservative treatment of timber," etc.

Mr. GRAVES. I will ask Mr. Greeley to present item 260.

FURTHER STATEMENT OF MR. W. B. GREELEY, ASSISTANT FORESTER, FOREST SERVICE.

Mr. GREELEY. Mr. Chairman, the money appropriated under this item is used for three different purposes. By far the larger part of it is used for the maintenance of the Forest Products Laboratory of the service at Madison, Wis., which is devoted to intensive investigations in improved utilization of woods. Another portion is used for investigations and improved utilization of national-forest timber, and a third for statistical investigations and general industrial studies bearing upon the use of woods throughout the United States.

The most important work the service is doing under this item is that in our laboratory at Madison, where intensive studies of the preservation of timber by artificial treatment and the manufacture of by-products from waste and from species of low commercial value are carried on. Studies of the manufacture of pulp and paper, both to improve the present methods and reduce their cost, and also to extend the raw material available for the pulp and paper industries of the country, by ascertaining what can be done with new species, are in progress. Other investigations of the laboratory deal with the fireproofing of timbers to determine how far it is possible to improve their structural uses by making them more resistant to fire. We have a long program of some 60 different investigations in progress at that institution. The feature of its work which I wish to refer to specifically is the cooperation which is being developed with wood users and industries throughout the entire country.

During the past year, for example, we had cooperation in effect with 113 railroad and telegraph companies in making service tests of treated timbers, with a large number of manufacturers of wood preservatives and fireproofing compounds in getting actual tests of the value and efficacy of these preparations, and with the manufacturers of dyes to develop native sources of dye materials, like the osage orange of the Southwest, from which our laboratory has succeeded in developing a valuable yellow dye that is an excellent substitute for the fustic wood imported from tropical countries.

Mr. MCLAUGHLIN. What do you mean by cooperation?

Mr. GREELEY. I mean an arrangement under which our experts, in cooperation with commercial interests, make tests and demonstrations to further try out the results obtained at the laboratory and show what can be done with them under commercial conditions.

Mr. MCLAUGHLIN. How about the expense?

Mr. GREELEY. The expense of these cooperative studies is divided, the commercial interests—companies or individuals—paying a considerable portion of it. The usual arrangement is for the Government to furnish the salary of the expert employees and the other party to pay the entire cost of materials, subsistence, labor, special equipment, and that sort of thing.

Mr. HOWELL. Can you give without much difficulty the chief triumphs that have resulted from your investigations?

Mr. GREELEY. Probably the most distinctive thing has been a series of investigations which has added some 15 or 20 new woods to the raw materials from which pulp and paper can be economically made.

Another distinct accomplishment has been an improved dry kiln, whereby the loss in seasoning woods can be very largely eliminated.

The present loss from this source alone to the lumber industry is about $21,000,000 a year. The experts at the Forest Products Laboratory have developed a scientific dry kiln with which it has been found possible to largely eliminate this loss. It is a kiln that is now being installed by manufacturers of valuable hardwoods and other wood using industries at several points.

Other investigators at the laboratory have developed improved methods of wood distillation, whereby the yields of the common distillates from hardwoods can be very greatly increased. At one of the plants in Michigan, where a demonstration of this method was made, it was shown that using the apparatus and processes of this plant, but with better manipulation and control of the various factors entering into the distillation, a net gain of something over $200 a month was possible.

Mr. MCLAUGHLIN. What kind of an industry was that?

Mr. GRIFFITH. This was the distillation of hardwoods for charcoal, acetate of lime, and wood alcohol.

The CHAIRMAN. Have you any more triumphs? That is very interesting and we want to charge this up to profit and loss.

Mr. MCLAUGHLIN. Are these things in the form of bulletins, so that they are available for distribution?

Mr. GRIFFITH. Yes, sir; we publish a series of bulletins which set forth the results of these investigations. There were 25 or 30 issued in the past year. They are published by the department.

Mr. HAWLEY. How did that laboratory happen to be located in Wisconsin? It is not pretty much out of the general centers of wood?

Mr. GRIFFITH. No. On the contrary, I would say that it is very centrally located from the standpoint of keeping in touch with all parts of the country. The upper Mississippi Valley has been the leading lumber market of the country; and we find that the location at Madison is very favorable for keeping in touch with lumbermen from the South, East, and West alike. The location was made as the result of a cooperative agreement with the University of Wisconsin, which furnishes the building and the light and power.

Mr. MCLAUGHLIN. Mr. Pinchot determined to establish that laboratory.

Mr. GRIFFITH. We have a small laboratory also at the University of Washington, which is conducted in cooperation with that institution.

Mr. MCLAUGHLIN. Mr. Pinchot desired to have it at one of the large universities.

The CHAIRMAN. What have you found recently in connection with wood preservation treatment?

Mr. GRIFFITH. The principal work in wood preservation during the past year has been directed to improving wood-block paving, which has very great promise both as a means of utilizing wood and also as furnishing the public with a very excellent paving material. The preservation of wood-block paving has presented a good many problems in developing the treatment to get good service; and our experts in the preservation laboratory have worked out a method of overcoming these difficulties which promises good results. We are not yet prepared to announce any triumph upon that investigation, but we have a good lead.

Mr. HAWLEY. What woods are you experimenting on?

Mr. GREELEY. The woods used principally for paving are southern yellow pine, tamarack, Norway pine, and Douglas fir.

Mr. HAUGEN. What treatment do you suggest outside of the creosote?

Mr. GREELEY. Paving oil from tar products is the best treatment. I think there is no other that compares with it. The harder and more even-grained woods, like southern yellow pine, the Douglas fir of the west coast, and the tamarack and Norway pine of the Northern States are adapted to the purpose.

The demand for cooperative work in demonstrating under commercial conditions the practical use of the laboratory's results is greatly increasing. It has exceeeded our possibilities of meeting it; and we are now in the position of having to reject favorable offers of cooperation. There is, for example, a very urgent request that we take up actively the possibility of manufacturing paper and other products from wood waste at the yellow-pine mills of the Southern States, where there are enormous quantities of waste in the manufacture of lumber now put to no use whatever.

Mr. MCLAUGHLIN. Does that include sawdust?

Mr. GREELEY. Yes, sir. This would require an extensive test, which could be carried on in cooperation with some of the plants in that region.

Mr. HAWLEY. There is a mill down on Coos Bay, and they run the sawdust, the shavings, the edgings, and frequently pieces of lumber, and make it into pulp—out of Douglas fir, very largely. What is the problem here—to reduce the cost of the method?

Mr. GREELEY. The particular problem in the South is to recover the resin and to put the cost on a practicable basis.

Mr. HAWLEY. Is it more resinous than the Douglas fir?

Mr. GREELEY. Very much more. Of course, an experiment carried out in a laboratory does not give results that you can apply in the commercial field. You have to make a further demonstration of the process and methods under commercial conditions. That is what we aim to do in this cooperative work—to take our ideas and try them out under commercial conditions.

Mr. HOWELL. Is it not a fact that in the mills operating by steam power the sawdust and other things are utilized for fuel for the engine and boilers?

Mr. GREELEY. A portion of it is so used. But in nearly all large sawmills you will see the sawdust and other waste conveyed to large stacks, where it is burned up.

Mr. HAUGEN. I wish you would give a more detailed statement as to what progress has been made on the paving-block proposition. I believe that is one of the most important projects in the country to-day.

Mr. GREELEY. Our work in wood paving has been conducted largely in cooperation with the engineering departments of cities which are interested in developing this paving. For example, several years ago we cooperated with the city of Minneapolis.

Mr. HAUGEN. To what extent have you developed it? What progress have you made?

Mr. [illegible]. The principal progress that has been made is in [illegible] the seasoning of timbers during war weather, the [illegible] the rotting out of the ends of ties [illegible].

Mr. [illegible]. Is that to be overcome by a certain treatment?

Mr. [illegible]. That is to be overcome by proper treatment in the [illegible] of the woods. This is the problem we have been trying to work out, and we think that we have got it solved.

Mr. [illegible]. I understand the marks are expensive and make [illegible].

Mr. [illegible]. The first cost is relatively high, but this is offset by [illegible] the very low maintenance charges. It is not a problem of discovering new woods. There are plenty of woods which [illegible] by giving them such treatment that they will [illegible] good service. An untreated pavement would go to pieces within a short time, whereas there are plenty of woods [illegible] the process of treatment can be worked out successfully.

Mr. [illegible]. You are making progress along that line?

Mr. CHITTENDEN. Yes, sir. The principal progress made has been in [illegible] the creosote treatment and overcoming the difficulties which I mentioned.

The CHAIRMAN. Tell us a little bit about your imported-wood work.

Mr. CHITTENDEN. We are restricted by law, Mr. Chairman, to the investigation of American woods, except foreign woods of importance to industries in this country. A few tests have been made on South American and Central American woods, both because of their value to our industries and also because such tests were requested by the countries interested in the development of these woods. For example, last year we tested several woods which were sent to us by the Government of Chile, with the request particularly to ascertain their paper making qualities, and a report was made to the Chilean Government on these woods. We have not done any great amount of work on woods outside of the United States.

The CHAIRMAN. Is there anything further you would like to say in reference to your work?

Mr. CHITTENDEN. I would like to mention briefly another phase of the work in forest products under this item; and that is the collection of statistics on forest-using industries. The Bureau of the Census is not equipped to do this work to the extent to which the industries require. For example, the Bureau of the Census can obtain statistics on the production of lumber only once in five years. The industry is very anxious to have these figures annually, and we have found it very important to obtain such data every year. A great many of the wood-using industries are anxious to secure our [illegible] vital figures on their trade, such as the annual consumption of raw material and the annual output of finished products. That is work to which we are giving a great deal of attention now, and we believe it to be of great importance. We are doing what we can with the funds available under this item; but the only way we can get such statistics at all is by cooperation with the industrial interests concerned which are willing to contribute to the cost.

(Thereupon, at 5.25 p. m., the committee took a recess until Monday, January 31, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Monday, January 31, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever hairman) presiding.

'ATEMENT OF MR. ALBERT F. POTTER, ASSOCIATE FORESTER, FOREST SERVICE.

The CHAIRMAN. Dr. Graves, we had completed item 260, and we ill now take up item 261, "For experiments and investigations of nge conditions within national forests or elsewhere on the public nge, and of methods for improving the range by reseeding, regula- on of grazing, and other means." Tell us something about that.

Mr. GRAVES. I would like to call on Mr. Potter to make that state- ent.

The CHAIRMAN. All right, Dr. Potter.

Mr. POTTER. Mr. Chairman, the past season has been a peculiar ie in regard to grazing on the national forests. Although in gen- al the rainfall was much less than usual, the forage crop was good id stock came off the range in better condition than the year before. is apparent that what the feed lacked in quantity was made up in ıality, and that under the drier climatic conditions the forage grown is a higher food value than in the very wet seasons.

The prices obtained for beef and mutton did not average quite as igh as for the year before, but this was made up in increased eight, so that the net returns to the stockmen were fully as good.

Under the increased authority granted last year, in the item for xperiments and investigations of range conditions, the Forest ervice has taken charge of the Jornado and Santa Rita range-ex- eriment reserves in New Mexico and Arizona, on which the Bureau f Plant Industry had already begun work. The areas of these ex- eriment stations or range reserves are, respectively, 200,000 and 0,000 acres. On the Jornado, which is the larger, 5,000 head of ıttle owned by Mr. Charles Turney are being grazed under a coop- rative agreement. These cattle are to be handled in accordance ith the plans of the Forest Service and in a way which will per- it the carrying on of the different experiments. To begin with, 00 of the best breeding cows have been selected and put in pastures eparate from the other stock. A study will be made to find out hether it is possible under an improved system of management to ıcrease the percentage of calves raised and also to increase the eight of the calves at the time of weaning. Of the general herd ne-third will be made up of steers, which will be kept in separate astures, so that in the event of a drought, such as this country is at mes subject to, the steers can be disposed of and the breeding herd iven the use of the entire range.

In this way the maximum breeding capacity can be maintained. s an adjunct to the natural feed on the range, experiments will be ıade in making ensilage of soap weed, galleta grass, and other oarse forage which at present is unused. A cement silo has been onstructed for this purpose. Experiments in alternate grazing on ifferent kinds of range and many other experiments in range man-

agement are to be carried on. It is confidently expected that results will be secured which will be of value to the stockmen in demonstrating ways in which the range may be made to produce more and better stock.

Mr. HOWELL. What kind of grass is that that you mentioned?

Mr. POTTER. The galleta grass, one of the coarse grasses of the South.

A good illustration of the value of improving the breed of range stock is found in a report received from the Cache National Forest. Of two permittees using this range one has given close attention to the selection of his breeding cows and has bought only high-grade bulls; the other has made no effort to improve his herd. Both permittees use the same amount of range per head of stock and pay the same grazing fee. Last fall it happened that they shipped their steers at the same time and sold on the same market. The owner of the high grade stock received $40 per head more than the owner of the common stock. This shows that it pays to raise good stock.

On some of the national-forest ranges the permittees club together and buy high-grade bulls, which are owned as community property. Every effort is being made to encourage the use of good breeding stock on the national-forest ranges and to eliminate the scrubs.

Among the new studies which have been undertaken is one to ascertain the possibility of grazing sheep on certain types of range without water. Three thousand two hundred ewes with their lambs were grazed on the Uinta National Forest during the past season, from June 10 to September 20, without water other than the natural moisture found in the succulent feed and the dews usual to high ranges.

Mr. LEE. Was there any rainfall during that time?

Mr. POTTER. There was some rainfall. The lambs weighed up to the average and the ewes were in good condition at the end of the season. The principal requirement is that the sheep must be allowed to graze quietly and to get in cool, shady places during the heat of the day.

Experiments in deferred and alternate grazing, improved methods of herding, and eradication of poisonous plants are being continued, and many other experiments are under consideration, which will be of value to the stockmen and will bring about a fuller and better use of the national-forest ranges. The stockmen in general are taking a great interest in the research work which is being done by the Forest Service and are heartily cooperating with us in carrying on that work. As an illustration, last summer we started an experiment on the Stanislaus Forest Reserve in California to eradicate the poisonous plants, especially the larkspur, which had caused serious losses among the cattle the year before, when there was a loss of 34 head of cattle on a particular range in that forest. In cooperation with the stockmen we put in men on a part of that range with grubbing hoes and mattocks, and they grubbed out all the larkspur at a cost of $695, half of which was borne by the Stanislaus people in cooperation with us. Last year only four head of cattle were lost, and, so far as I know, the deaths were not caused by poisonous plants. So the work is more than paying for itself in the saving made during one season. This is a practical demonstration of what can be done through an extension of the work of the department in this

direction and from understanding the problems and going at them in a proper way. This work is being received with very great satisfaction by the stockmen.

Mr. LEE. Will not those plants have to be grubbed every year?

Mr. POTTER. No, sir; we grub them once, and that kills them.

Mr. HAWLEY. How deep down in the ground do you grub?

Mr. POTTER. Several inches.

Mr. HAWLEY. It is not difficult to reach it?

Mr. POTTER. No, sir; it can be reached with a mattock. Now, if the committee desires to have a more detailed statement in reference to the research work, I would be very glad to have Mr. Jardine given an opportunity to say something regarding its details.

The CHAIRMAN. I think if he can brief it up as much as possible we would be glad to have it.

Mr. HAWLEY. Will you state to the committee what you estimate is the increased capacity of the range for supporting stock under the administration of the Forest Service over what it was before?

Mr. POTTER. There has been an increase in the number of stock raised on the forest reserves during the past 10 years, comparing the area in the forest at that time and now with the number of stock on the range then and now, of 50 per cent. That has been due partly to improvement in the condition of the range and partly to opening up to use ranges which were previously unused, through the construction of trails and bridges and other methods of getting the stock to graze where they ought to graze. In some particular instances there has been an actual increase in 50 per cent of the stock on the same area without the opening of new range. That has been done on the Madison Forest in Montana, where we are now grazing 50 per cent more on the same area.

Mr. HAWLEY. How would that apply to all the lands that have been grazed before that the Forest Service took charge of?

Mr. PORTER. There has been an increase in grazing capacity in practically all the lands that were grazed before, but not 50 per cent on all.

The CHAIRMAN. To what is that increase due?

Mr. POTTER. It is due to a better system of management in grazing stock on the forests—first, through a determination of what the range is best adapted for, whether cattle grazing or sheep grazing; second, a determination of the part of the year that it should be used in, whether it is naturally a winter range or a summer range, and using it during that part of the year that it is best adapted to; and, third, keeping the stock off of the summer range until the feed has made a good start, so that when they go on there there is sufficient forage for them, rather than allowing them to rush on as they did formerly, before the feed got a good start, and oftentimes destroying more feed by trampling than they ate. That is largely the cause of the increased grazing capacity of the forests. It is better management of the stock on the national forest ranges.

The CHAIRMAN. Is it your statement, then, that the number of sheep and cattle grazing on the public domain to-day is 50 per cent larger than it was 10 years ago?

Mr. POTTER. The number of cattle and sheep grazing on the public lands within the national forest; yes.

The CHAIRMAN. It is 50 per cent larger?

Mr. POTTER. Yes, sir.

The CHAIRMAN. That does not mean, however, that the total number of sheep in the United States would be 50 per cent larger?

Mr. POTTER. No, sir.

The CHAIRMAN. Now, just how do you divide out this territory between the individuals who have the sheep and cattle for grazing purposes?

Mr. POTTER. By natural landmarks as far as possible, using streams and crests of hills, where that is not practical, by construction of drift fences between the larger range units.

The CHAIRMAN. Does the forest give any preference to the small owner as against the large owner?

Mr. POTTER. Yes, sir.

The CHAIRMAN. [illegible] the same show?

Mr. POTTER. It has always been the policy of the Forest Service to favor the small owner and to take care of him first, and not only that but to allow the small owner to gradually increase his herd by reducing the larger [illegible] to furnish the necessary additional range if it can not be [illegible] by opening up new range.

The CHAIRMAN. Have you fixed the limit of the number of sheep or cattle that may be grazed in the national forests?

Mr. POTTER. Yes, sir. There are maximum limits established for the different forests, which are determined in accordance with the local conditions. In sections of the country where there is very intensive use of the range the maximum limit is relatively low. In sections of the country where the holdings are generally large they are comparatively high. The maximum limits on cattle are from 50 head to as high as 1,000 head. The maximum limits on sheep are from 500 head to as high as 2,500 head. That is the maximum number of stock that any one outfit may acquire permits for in the future.

The CHAIRMAN. Then, I take it from your statement that the maximum limit on the number of cattle or sheep is fixed really by the maximum capacity of the range, in a way?

Mr. POTTER. Well, by the use of the range; that is, as to whether or not it is an intensive use—in other words, it depends on what the demand is. Where there is a demand from a large number of users, necessarily the maximum is lower than where there is a demand from only a small number of users.

The CHAIRMAN. In other words, if a certain range were asked for grazing purposes by a number of people you would have one maximum?

Mr. POTTER. Yes, sir.

The CHAIRMAN. If you had another range where there were only a few asking, of course you would increase the maximum?

Mr. POTTER. Yes, sir.

The CHAIRMAN. That is to say you try to make the fullest use of the forest?

Mr. POTTER. Yes, sir; we try to make the fullest use of the forest and reduce the limit as the local conditions require it for the protection of the small owner.

Mr. HAWLEY. How many large outfits were compelled to reduce their cattle, horse, and sheep herds by reason of the maximum limitation? Have you any idea?

Mr. POTTER. Yes.

Mr. HAWLEY. I did not know whether you had that in your papers r not.

Mr. POTTER. I had not quite completed my statement in refernce to the maximum limitations, Mr. Hawley.

Mr. HAWLEY. Well, go on.

Mr. POTTER. It was simply this: That the maximum limit restriction does not apply to the stockmen who were on the range at the time he forests were created. That is, we might have found an outfit sing the range which had 20,000 head of sheep and establish a aximum limit in that forest of 10,000 head of sheep. That would ot mean that we would arbitrarily reduce the 20,000 down to 10,000 or the first year, but we would gradually reduce that outfit. We ould not allow anyone who had less than 10,000 to increase their ermit to more than 10,000 by buying other people out. In other ords, the maximum limit is a guaranty against the consolidation r monopolization of the range in the future rather than to arbiarily reduce those who are already there, further than such reducons as may be necessary to take care of the small owners.

Mr. HOWELL. Have you any way to estimate what the full capacity of the national forests, for grazing will be?

Mr. POTTER. I would say roughly at least 15 per cent more than t present.

Mr. HOWELL. How many applications for grazing do you have to ject from year to year.

Mr. POTTER. I could not say just the number. I could get that gure for you.

Mr. HOWELL. It is a considerable number, is it not?

Mr. POTTER. Yes; there is a considerable number. There are in ound numbers 30,000 permits issued, and each year there are quite number of applications rejected.

Mr. LEE. That is on account of congestion in certain sections?

Mr. POTTER. Yes, sir; because of the large number of permittees, nd because we can not reduce the larger owners fast enough to make om for all the new owners. However, during the past four years e have provided for 4,500 new permittees who own less than 100 ead of cattle each.

Mr. HAUGEN. Is there much competition among the grazing men?

Mr. POTTER. Yes, sir.

The CHAIRMAN. How do you meet that competition? For instance, ere are two men asking for permits, each having 10,000 sheep, each oking good in the face, each seeming to be good citizens. How are ou going to handle them?

Mr. HAUGEN. Are permits let to the highest bidder?

Mr. POTTER. No, sir; not at all. We only take care of new applints who are resident ranch owners within or adjacent to the forest, ving near enough to be dependent on the national forest for pasture r a number of stock which they need to run in connection with their rm to insure its success. Of course, that is usually only a comratively small number of stock. We do not cut down the permit one big outfit to take care of another big outfit.

Mr. HAUGEN. How many permits are issued to owners of more an 2,000 cattle or 10,000 sheep?

Mr. POTTER. There are 35 permits for more than 2,000 cattle and permits for more than 10,000 sheep. The number of stock now

[illegible] committees is much less than the number they [illegible] when the national forests were created.

[illegible] communicate all those who desire permits [illegible] your forest?

[illegible]

[illegible] discriminate as between them?

[illegible] have something to do with it?

[illegible] have something to do with it.

[illegible] sometimes to determine between [illegible]

[illegible] think so.

[illegible] the general policy of taking [illegible] the use of the range.

[illegible] when you once issue a permit it is permanent?

[illegible] when we issue a permit it is permanent. It [illegible] to comply with the regulations.

[illegible] the same fees permanently?

[illegible] The rates charged for grazing is uniform and [illegible]

[illegible] the record the price you [illegible] under any other item or [illegible]

[illegible] The average price for cattle is at present 54 cents. [illegible] is 25 cents per annum.

[illegible] How many months would that be for?

[illegible] For the entire year. Where the stock are only [illegible] for a period of less than a year [illegible] we charge on the basis of one-tenth of [illegible] for each month. That is for less than four months, we [illegible] at the annual rate per month.

[illegible] What charge per cents for cattle per year?

[illegible]

[illegible]

[illegible] You want to go into the cat- [illegible]

[illegible] charge a dollar a head a month in [illegible]

[illegible] the range they require [illegible]

[illegible] the time they are on the range; [illegible] after they are taken out: that is, [illegible] and they graze on the forests in the [illegible]

[illegible] to keep them within [illegible]

[illegible] We require the stockmen to keep their cat- [illegible] they are grazing, and that means that they [illegible] to look out for the cattle. Those men [illegible] in case of forest fires. They are very useful [illegible] as they can always be secured on short notice.

[illegible] Doctor, this is not quite in line with your work. [illegible] I am satisfied you must have some information about it. It [illegible] Bureau of Biological Survey. Is there much dam- [illegible] cks of sheep from wild animals and things of that

Mr. POTTER. Yes, sir. That is one of the serious menaces to the ve-stock industry. Our men have done a great deal in the exter-ination of predatory animals on the national forests by shooting em whenever they have an opportunity to do so. Of course, the ngers, being out on the range all the time, have opportunities to oot the predatory animals.

The CHAIRMAN. Is it your judgment that there is any possibility f exterminating these predatory animals if the fight is kept up ainst them vigorously?

Mr. POTTER. Well, it is going to take——

The CHAIRMAN (interposing). Suppose I do not use the word exterminate," but say "very greatly reduce."

Mr. POTTER. Yes; they can be very greatly reduced.

The CHAIRMAN. You can reduce the damage they do?

Mr. POTTER. Yes; but to entirely exterminate them would take a ng time unless it is gone into in a more vigorous way. Of course, is going to be a hard thing to do anyway.

Mr. HOWELL. Do you encourage any individuals who go on the nges not to kill these animals?

Mr. POTTER. No, sir; we encourage them to kill them.

Mr. MCLAUGHLIN. Do you pay bounties?

Mr. POTTER. No, sir; but the counties often do.

Mr. HOWELL. They pay $2.50 in Utah for coyotes.

Mr. MCLAUGHLIN. For what kind of animals, and how much do ey pay?

Mr. POTTER. The State bounty frequently varies, Mr. McLaughlin. think the average would be about $2.50 for coyotes and $10 for olves and mountain lions. That is about the average bounty.

Mr. STEELE. South Dakota pays $25 for timber wolves and $2.50 or others.

Mr. MCLAUGHLIN. Have you any idea about how much money has een paid out by the States in this connection?

Mr. POTTER. No, sir; I have not. The total number of predatory nimals destroyed by forest officials last year was 3,843.

Mr. HAWLEY. Mostly coyotes?

Mr. POTTER. Mostly coyotes.

Mr. HOWELL. I think that would be the average in the States. he State of Utah imposes a county tax of 4 mills upon live stock o constitute a fund to pay for the bounties for killing wild and pre-atory animals. In addition to that there is a State appropriation f $20,000 annually.

The CHAIRMAN. But the coyote does not kill a cow.

Mr. STEELE. It kills calves.

Mr. POTTER. Yes, sir; it kills calves.

The CHAIRMAN. But mostly sheep.

Mr. POTTER. The coyotes prey mostly upon sheep; the wolves on attle; and the lions on horses. It is almost impossible to raise horses n a country where there are lions. The States are unquestionably aying out a great amount of money in their efforts to exterminate redatory animals, and it is my belief that the Government should o its share in that work; that is, that we should cooperate with the tates and bear a part of the burden.

Mr. HOWELL. The national forests are the most prolific sources of he increase of these animals.

Mr. [illegible] not think that is the case. The investigations made indicate that the most predatory animals exist where there is the most stock. During the summer time when the stock are mostly on the national forests it is true that the predatory animals follow them in there, and a greater part of the [illegible] in the mountains. But the dens of the wolves and mountain lions are located in the foothills, which would be along the edges of the forest or on the range just outside of the forest during the summer, of course, a very large number of predatory animals in the national forests, for the stock and game are there, and the predatory animals follow them.

Mr. [illegible] and mountain lions are there?

Mr. [illegible] and mountain lion stay in the same place.

Mr. [illegible] suggest an appropriation to be used [illegible] these predatory animals?

Mr. [illegible] which there is a great deal of [illegible]

Mr. [illegible] been considered by your [illegible]

Mr. [illegible] [illegible] by the Department of [illegible] was reached that it would be inadvisable [illegible] it was thought that the money would be [illegible] the Government in the extermination [illegible] used in the employment of experts in [illegible] of the country where the predatory animals were doing the greatest amount of damage.

[illegible] and the Senate added $75,000 to the department [illegible] work.

Mr. [illegible] work on the coyotes that are [illegible] principally in California, Nevada, and Oregon.

Mr. McLAUGHLIN. [illegible] employing expert hunters is that they would [illegible] service examination, and if they [illegible] they would never be detached [illegible]

Mr. [illegible] they them I would like to take the examination.

Mr. McLAUGHLIN. [illegible] animals infected with rabies. Does [illegible] this section of the bill that we are discussing?

[illegible] the Biological Survey.

Mr. POTTER. We are cooperating in that work with the Biological Survey [illegible] the State authorities [illegible] through having the rangers [illegible] the extermination work within the national-forest areas. The Biological Survey has a very large force of hunters who have been employed especially for that work.

Mr. HOWELL. The Biological Survey also got up some system of poisoning these animals. They have been studying the question and trying to find out a poison that will destroy them.

Mr. McLAUGHLIN. How generally do you find animals infected with rabies, and what are you doing about them?

Mr. POTTER. The rabies, as I understand, first started on coyotes in Montana. They were next bad in the Blue Mountain country in [illegible] and now the epidemic is in southern Oregon, northern California, western Nevada. Whether it is a spread of the disease

m one coyote to another along through that general line of terri-
y, we are not sure, but very likely it is. So far outbreaks of
ies among coyotes have been in Montana, in the Blue Mountain
ion in Oregon, and down in the northern part of California and
stern Nevada. The only way of checking it is to kill the coyotes,
l not only kill the coyotes, but kill all the dogs that are running
se and liable to be bitten by coyotes.
Mr. HOWELL. When the coyotes are stricken with rabies they lose
ir natural timidity.
Mr. POTTER. Yes; they apparently become insane.
Mr. HAWLEY. They will chase people in automobiles.
Mr. MCLAUGHLIN. You would not object to an appropriation for
t purpose, would you?
Mr. HOWELL. There are people in Nevada who have been bitten by
'otes affected with rabies and they are now undergoing treatment.
Mr. POTTER. It is a very serious thing.
Mr. HAWLEY. They are losing a great deal of stock by reason of
coyotes biting them.
Mr. POTTER. That is true, but the immediate danger is to the people.
The CHAIRMAN. Well, Doctor, I think you have covered this item
y fully.
Mr. MCLAUGHLIN. Is there any appropriation that has been used
can properly be used for this service?
The CHAIRMAN. Not in the Forest Service, but in the Biological
rvey, except that the Forest Service cooperates under this item.
ctor, your rangers who protect your grazing permits are armed
h shotguns and rifles, are they not?
Mr. POTTER. Yes, sir.
The CHAIRMAN. But not all of them, I imagine?
Mr. POTTER. The ones that are working in this locality are armed,
l they are being furnished with ammunition by the Biological
rvey.
Mr. HOWELL. The bounties that are paid by the several States
ere these forest reserves are situated offer an inducement to the
rious forest rangers to kill these predatory animals.
The CHAIRMAN. Do you pay bounties to the forest rangers?
Mr. POTTER. Where the bounty is paid voluntarily the rangers
e allowed to accept it, but not where there is any objection to the
ying of it. In a great many localities the stockmen's association
d the county governments are glad to have the rangers collect the
unties, because they feel that it is an extra inducement to them
kill the predatory animals.
The CHAIRMAN. A moment ago Mr. Hawley asked you a question,
r. Potter. Will you please answer it?
Mr. POTTER. Of the 5,000 permits issued to owners of sheep and
ats about one-half of them, 2,500, are permits for over 1,000 head
stock, and have been reduced to take care of or provide increase
r small owners. Of the cattle and horse permits, 17,000 out of
proximately 25,000 are to owners of less than 40 head of stock and
00 to owners of less than 100 head of stock, so that the number of
ttle and horse permittees whose permits have been reduced have
en restricted to the remainder, or about 3,000 permits.
Mr. HAWLEY. So that your plan is to protect a man who lives in
e locality in the use of the range?
Mr. POTTER. Yes, sir.

Mr. [illegible] that a man coming from a distance [illegible] that locality?

Mr. [illegible] That is to protect the local residents [illegible] the small man here and allow the small [illegible] to [illegible] the [illegible] the larger owners, if necessary.

Mr. [illegible] I believe that has resulted, it is [illegible] to take care of stock and has increased [illegible] the range.

Mr. [illegible] Has it resulted in increasing the [illegible] the use of the range?

Mr. [illegible] The chairman will remember that a good [illegible] that would suit the and it seems [illegible] the tables [illegible] will into the record.

The CHAIRMAN. That is a very good suggestion. I think Mr. Pa[illegible] has pretty well covered this question.

Mr. Howell. What description of the cattle and live stock in the several States in which the forest reserves are situated are grazing on the forest reserves?

Mr. [illegible]. About one-third are grazing during at least a portion of the year on the public lands. In other words, about one-third of the public lands in the West are in the national forests.

Mr. Haugen. You have a very interesting table here. I suggest that it be printed in the record. It gives a classification of the permits.

The CHAIRMAN. Let it go in the record in connection with Mr. Haugen's question.

The statement referred to follows:

GRAZING PERMITS

[illegible]

State	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arizona	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arkansas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Montana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Washington	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
West Virginia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wyoming	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

er of permits and stock classified according to grade of permits, fiscal year 1915—Continued.

SHEEP AND GOATS.

State.	Grade 1 (1 to 1,000 head).		Grade 2 (1,001 to 2,500 head).		Grade 3 (2,501 to 4,000 head).		Grade 4 (over 4,000 head).	
	Number permits.	Number of stock.	Number permits.	Number of stock.	Number permits.	Number of stock.	Number permits.	Number of stock.
	28	15,179	61	120,095	39	137,313	16	121,560
in	149	80,716	153	250,872	8	24,632	7	41,350
	172	89,985	196	290,775	25	80,986	23	169,517
	3	321						
	9	74						
	148	91,979	289	472,799	92	288,278	105	741,670
	1	300						
a	121	48,927	174	269,812	54	172,620	39	239,998
	4	2,601	37	61,608	21	67,505	36	322,901
xico	404	134,488	102	150,259	12	40,394	16	117,978
arolina	24	226						
	94	45,895	345	508,265	38	118,946	18	96,480
ee	4	41						
	1,103	422,687	321	430,407	15	44,605	3	22,135
gton	26	15,323	111	153,431	17	48,461	4	21,609
rginia	8	60						
ng	73	29,342	127	209,997	40	125,275	54	343,008
otal	2,371	978,144	1,916	2,918,320	361	1,149,015	321	2,238,206

. STEELE. Has this division of the Forest Service charge of United States lands outside of the reserves?

. POTTER. No, sir.

. STEELE. What department takes care of that?

e CHAIRMAN. The Department of the Interior. It is the Public Office, is it not, Mr. Potter?

. POTTER. Yes, sir.

e CHAIRMAN. Mr. Potter, would you like your assistant to make further statement?

. POTTER. Yes, sir.

EMENT OF MR. JAMES T. JARDINE, GRAZING INSPECTOR, FOREST SERVICE.

. JARDINE. Mr. Potter mentioned the case on the Stanislaus st where, at a cost of $695, an apparent saving was made in one of about $1,500. The annual reports received from the various ts show a loss in the last year of over $350,000 in live stock due isonous plants.

. HAWLEY. What poisonous plants besides larkspur?

. JARDINE. Death camas, water hemlock, lupine, and some others are not so well known.

. HAWLEY. And hellebore.

. JARDINE. Hellebore we do not consider dangerous at all.

. OVERMYER. And loco.

. JARDINE. Loco is one of the worst problems we have and the difficult to handle. This work on the Stanislaus is simply wing up practically the work of eradication that has been done n experimental scale for the past two or three years. If we

great annual loss it will be a very important step ... work. In some places the loss can be prevented by fencing, ... eradicating the plants, and in some instances by change ... class of stock.

Mr. SCOTT. Is the fencing done by you?

Mr. JARDINE. By the Government in some instances, and in some ... with the stockmen. In a few cases the stock- ... put their stock on the range unless something ... with the poisonous plants, thus placing the responsi- ... upon the Government.

The CHAIRMAN. The scientific work along this line at one time ... Forest Service, but it was transferred and I under- ... by the Bureau of Plant Industry. Is that ...

Mr. ... Forest Service is responsible for the manage- ... within the forests. The experts of the ... furnish us as to the plants which are ... methods of preventing loss. The problem ... these data into effect—in actual man- ... this necessitates a knowledge as to the lo- ... poison areas and the working out of grazing ... as to minimize or eliminate loss of ... Colville Forest reserve last year 2,000 ... a station on the Great Northern ... because they grazed a patch of death ... have avoided the poison area had the dan- ... precautions taken.

The CHAIRMAN. Is there any duplication of work between your ... the work of the Bureau of Plant Industry?

Mr. JARDINE. Not on the areas, so far as we have been able to help. We have had conferences with the Bureau of Plant Industry people as to the botanical phases of the work and with the Bureau of Animal Industry on the feeding tests with animals.

The CHAIRMAN. I appreciate the fact that you are cooperating. ... to me that the line of demarcation is rather obscure.

Mr. JARDINE. I feel that the line is rather distinct. In other words, ... charged with the management of the grazing of those lands ... the farmers charged with the running of his own farm. ... After they give us this information, unless some one follows it up it ... would be difficult to fully use the ranges without unwarranted loss ... of stock.

The CHAIRMAN. In other words, you are the demonstrator?

Mr. JARDINE. Yes, sir.

Mr. HAUGEN. How does the death camas differ from the white camas?

Mr. JARDINE. It is an entirely different species. The death camas is poisonous. The blue camas or white camas is harmless. In connection with the handling of sheep, we have advanced to such an extent ... we can maintain our experimental work. It is estimated that at ... 70 per cent of the sheep on the national forests to-day ... handled under what we call the improved method of handling. ... results an increase in the carrying capacity of 10 to 15 per cent

er the old method of handling and an increase of 5 pounds in the eight of each lamb grown and handled under this system.

The CHAIRMAN. What is the difference between the two methods?

Mr. JARDINE. The old system was to establish a single camp and ail the sheep back to camp each night, sometimes 2 or 3 miles. The w system merely means following the sheep, staying with them ght and day, and especially at night, camping with the sheep wher- er night overtakes them, keeping them quiet, and grazing them enly on the range on which they are. This eliminates all the de- uction of range due to traveling back and forth, and eliminates e waste of energy in traveling and from undue excitement.

The CHAIRMAN. And that gives you how much per cent?

Mr. JARDINE. Our experimental figures show that it means an erage 10 to 15 per cent increase in carrying capacity, and in some ses it may be 25 or 30 per cent, depending on the bad management the intensity of bad management on the part of the individual rder under the old system.

Mr. MCLAUGHLIN. You spoke of the increase in the weight of the imals.

Mr. JARDINE. All of our tests show an average increase of about ounds. Those tests are made under our supervision and direction, t in cooperation with the sheep owners.

Mr. HAWLEY. Over how many years did these carrying-capacity sts extend?

Mr. JARDINE. Those carrying tests have extended over three years.

Mr. HAWLEY. Do you think that is long enough to get an average the season?

Mr. JARDINE. I think what is lacking in length of time has been vered in breadth of territory and duplication of experiments.

Mr. HAWLEY. You might have had a different average in good asons?

Mr. JARDINE. I should say that we gain more in bad seasons than a good season, because, by more careful handling, the range can e grazed more closely without injury and the sheep will hold up n less forage.

One of the points I wanted to take up was the difficult problem of etermining the carrying capacity of ranges. Our difficulty is in etermining what is the maximum. This will involve a good deal f future scientific study, and if it is not worked out it will mean his: That the only way to be sure of protecting these ranges is to lightly undergraze them.

Mr. HOWELL. That means a loss in actual production of live stock?

Mr. JARDINE. Yes, sir.

The difficulty of the problem lies in the fact that we have to work ut carrying capacity for so many different localities. We can not pply the same figures to all places, on account of the difference in ocal vegetation and local conditions.

Mr. STEELE. If you reached a maximum in two or three years with considerable rainfall and production of forage, would you be t any particular disadvantage if you had a dry season? You are figuring on that?

Mr. JARDINE. Yes, sir.

FURTHER STATEMENT OF MR. W. B. GREELEY, ASSISTANT FORESTER, FOREST SERVICE

mit success through the direct sowing of tree seeds on these denuded lands.

Mr. HAWLEY. What does it cost to get a growing tree planted, on the average?

Mr. GREELEY. The average last year for the plantations was $10 an acre, which means from 500 to 1,000 trees to the acre.

Mr. HAWLEY. That means trees growing out on the forest?

Mr. GREELEY. That means a tree grown in the nursery until it is 3 years old and then planted out on the forest.

Mr. HOWELL. Does that consider the cost of the tree in the first place?

Mr. GREELEY. Yes, sir; the cost of the tree and the cost of planting.

Mr. HAWLEY. And the transportation?

Mr. GREELEY. Yes, sir.

Mr. HAWLEY. Does that include the ranger's expenses?

Mr. GREELEY. That includes everything. The entire cost of the plantation is $10 or $12 an acre.

Mr. LEE. Mr. Greeley, after you plant these small trees, do not the sheep and the cattle destroy a great many of them?

Mr. GREELEY. If the land is overstocked, there is danger of destruction of the young trees by grazing, but in cooperation with the range administration the grazing is regulated on these areas so that the danger is very slight. In many places grazing has been stopped altogether until the trees are of sufficient size so that they can not be injured.

Mr. LEE. Why do you plant 1,000 trees to an acre?

Mr. GREELEY. Because that is necessary in order to secure a satisfactory stand of timber. The planting of a smaller number would give us a more open stand of less valuable timber, and while wider spacing would in time be filled up by natural reseeding, we believe that the extra cost of a few hundred trees is so small that it pays at the outset to plant a sufficient number to get a dense stand of timber. Furthermore, a margin is necessary to cover losses among the young trees after planting.

The CHAIRMAN. My recollection is that several years ago it cost from 3 cents to 13 cents per tree. Is that right?

Mr. GREELEY. The cost was very much higher then than at present.

The CHAIRMAN. Why?

Mr. GREELEY. Because from experience we have been able to reduce the cost. The methods in the nuseries and in the field planting have been improved sufficiently to reduce the cost.

The CHAIRMAN. When you say 120,000 acres, do you refer to land which you had planted to trees or to land which you had sown to seed?

Mr. GREELEY. Both. All forms of reforestation.

Mr. MCLAUGHLIN. How many years have you been doing that work?

Mr. GREELEY. It was begun in 1902.

Mr. MCLAUGHLIN. You have done it continuously?

Mr. GREELEY. We have been at it continuously, though for a long period the annual acreage planted was very small, only a few hundred acres a year.

Mr. McLAUGHLIN. How are those trees growing? What is the appearance of the old areas planted down through a series of years?

Mr. GREELEY. They have not been entirely successful. We have been doing the work in many parts of the country where the climatic conditions are unfavorable to forest growth, and we have learned how to plant from our experience in failures, as well as successes. We have certain successful plantations. In the sand hills of Nebraska, for example, we have areas which have been completely reforested to the point of trees producing seed and the seed being used in local nurseries. We have other areas in Idaho and western Washington where there are excellent forests growing from these plantations.

Mr. McLAUGHLIN. You speak of success. What was the success? Take a given year. How many trees are still growing and what is the case?

Mr. GREELEY. We reckon that a plantation is successful if at least 50 per cent of the planted stock survives and becomes established. Our success ranges all the way from that figure up to 90 per cent of trees that have lived; and there have been areas where the plantations were a total failure on account of particularly dry seasons, losses from rodents, and other factors with which we have had to deal as we went along.

The CHAIRMAN. Doctor, have you any estimate as to the number of acres in the national forests that ought to be reforested?

Mr. GREELEY. I gave a rough figure of 5,000,000 acres of denuded land which originally bore forests. Now, it is quite possible that a portion of that area will be restocked naturally, through the blowing in of seed from the nearest trees, but a large portion of it will have to be planted artificially.

The CHAIRMAN. At the rate you are now going it will take quite a little while to cover it?

Mr. GREELEY. Yes, sir.

The CHAIRMAN. Some 200 years, would it not?

Mr. GREELEY. Yes, sir.

The CHAIRMAN. Doctor, is this an undertaking that you think is possible of accomplishment? Do you think we ought to continue a thing that is going to take us 200 years to complete?

Mr. GREELEY. Rome was not built in a day, Mr. Chairman.

The CHAIRMAN. That is true.

Mr. GREELEY. And it is going to take us a good many years to complete this reforestation. I would like to point out the fact that the importance of reforestation differs widely on different areas. We are concentrating on certain areas where this work is of the greatest immediate importance. For instance, we are doing a good deal of work on the watersheds which supply cities with water, where it is most desirable to improve the conditions governing stream flow.

Mr. McLAUGHLIN. Are any of the municipalities cooperating with you in the way of spending some of their own money?

Mr. GREELEY. Yes, sir; practically every one of them, to a greater or less degree, is cooperating with us.

The CHAIRMAN. It is your hope, Mr. Greeley, as a matter of fact, that as your machinery is perfected you can very largely increase your reforestation every year?

Mr. GREELEY. Yes, sir; I think we can to some extent, although we [illegible] going a cost limit which will necessarily make further

reases dependent upon the appropriation available; and we can reduce our cost very greatly, as far as I can now see.

The CHAIRMAN. It seems to me you are doing it very cheaply as . One cent a tree is very cheap reforestation.

Mr. GREELEY. The cost is from 1 to 2 cents per tree. You unstand these are very small trees. They are grown by the millions the forest nurseries, usually transplanted once in the nurseries, d then set out in the forests.

Mr. YOUNG. What kind of trees do you plant?

Mr. GREELEY. The principal species are the white pine of Idaho, ngelmann spruce and lodge-pole pine in the Rocky Mountains, stern yellow pine, which is found in many Western States, and ouglas fir, the principal timber tree of the northern Pacific coast. e are also using other trees in localities where they are peculiarly apted.

Mr. HOWELL. Is there any inspection of this stock before it is sent t?

Mr. GREELEY. Only as to its vigor and hardiness.

Mr. HOWELL. Is there any blister rust affecting the shrubs or trees at are set out anywhere?

Mr. GREELEY. I think there is nothing of that sort in the West. he pine blister rust has not struck the West. In any event, our rseries are subject to State inspection.

Mr. HOWELL. When you sell timber off of the forest, I presume u expect that the forest will replant itself?

Mr. GREELEY. Yes, sir.

Mr. HOWELL. It is only in these denuded areas that you seek to tablish a new forest?

Mr. GREELEY. Yes, sir.

Mr. MCLAUGHLIN. Of course, as the chairman says, that will take long time; but the fact that it will take a long time is urged as a ason why individuals will not take it up at all. It does not offer ry much encouragement to an individual to know that his return ill not come during his life. That is urged as a reason why the overnment, and only the Government, can take it up and do it ccessfully.

The CHAIRMAN. And another reason is that an individual has no ntrol over the national forest.

Mr. MCLAUGHLIN. Well, even in his own property.

The CHAIRMAN. I did not ask the question in a spirit of criticism, t I was just trying to get information for myself.

Mr. HAWLEY. What does it cost to reforest an area by seeding?

Mr. GREELEY. It can be done usually for $4 or $4.50 per acre.

Mr. HAWLEY. Which is the most general method?

Mr. GREELEY. Using nursery stock; because we have found that eding is successful only on a few areas. We have been able to re-rest burns on the Black Hills of South Dakota by direct seeding, d we are covering about 2,000 acres a year there by that method. ie peculiar climatic conditions of their summer make it successful. e are using this method also on some of the high burns of the ocky Mountains, but, generally speaking, planting nursery stock cheaper in the long run.

Mr. HAWLEY. Will not the Douglas fir succeed just as well from seeding?

Mr. [illegible] ... destroys the young ... to contend with. While ... the people in the end to plant ...

Mr. [illegible] ... Oregon law and places that use ... Douglas fir in them ...

Mr. [illegible] ... have in mind of ...

Mr. [illegible] ... sense of success. So I understand ... that grow in the first instance and for ... to maturity——

Mr. [illegible] ... What I said was that we regarded plan... two-year-old trees as the best of the trees that we have used. I ... the danger period, which ... after they are set out. That is, they ... sufficient depth to tap a supply ... enough to maturity. But young ... start danger of loss from drought ...

Mr. [illegible] ... these trees when they are ...

Mr. [illegible] ... inches above ground and about twice ...

Mr. [illegible] ... them and what do you pay for ...

Mr. [illegible] ... grown by our own employees at a cost. ... from $4 to $5 per thousand trees.

Mr. Haugen. I understood you to say that you bought them from ...

Mr. [illegible] No, we raise them in our own nurseries.

Mr. McLaughlin. Is that cost of $10 an acre reached by taking into account the men who are on salaries and not charged directly to this work, or is that the independent cost—if that is the right term to use—of growing and setting out these trees and caring for them?

Mr. [illegible] No, sir; that is the complete cost of the trees, including salaries of rangers on the statutory roll, the pro rata share of improvements at the nursery, and everything else.

Mr. Haugen. And all overhead charges?

Mr. [illegible] Yes, sir; but not supervisory charges at the district offices.

The Chairman. Have you any further statement to make, Mr. Greeley?

Mr. [illegible]. I think that is all on this item, Mr. Chairman.

The Chairman. We are much obliged to you.

We will now take up item 263, "For silvicultural, dendrological, and other experiments and investigations independently or in cooperation with other branches of the Federal Government, with States and with individuals, to determine the best methods for the conservative management of forests and forest lands."

Mr. Graves. I would like Mr. Greeley to discuss that item.

Mr. Greeley. Item 263 is the one under which our experiment stations for the study of scientific silviculture are maintained on the

national forests. We now have eight of these stations, which have been established for the purpose of giving intensive study to the various problems involved in forestry in the Western States. Under this item also we are conducting various investigations in scientific forestry in the Eastern States, with reference particularly to determining the best methods applicable to the various types of forest, and cooperating with States and private owners in forestry work.

The principal project in the Eastern States during the last two years under this item has been a study of the farm wood lot and an effort to bring about better methods of handling the farm wood lot. The wood lots of our Eastern States contain something over 190,000,000,000 feet of timber, with a total annual product of $170,000,000, which is greater than either the tobacco or potato crop. We believe that the farm wood lot represents the best place for the practice of forestry by the private owner. We have during the past year completed a wood-lot survey in eight of the States, which has resulted in a publication for each State on handling wood lots and marketing their product, gotten out by the State itself. We are following that up by more intensive work in a number of the States, in the nature of wood-lot extension work, to bring home to the farmers the possibilities of better management of the wood lots. This work has been developed in connection with the extension work of the department under the Smith-Lever Act. We have found it necessary to put some of our own men into these States in order to demonstrate to farmers the possibilities of improved wood-lot methods and to get in touch with the extension organizations established by the Lever law. We believe this to be one of the most important pieces of forest work that confronts the department, and we are very anxious to extend and conduct it on a larger scale.

Aside from that, the principal work under this item has been a study of the economic conditions in the lumber industry in cooperation with the Federal Trade Commission and the Bureau of Foreign and Domestic Commerce. This study was undertaken a year and a half ago in collaboration with these other Federal agencies because the economic conditions confronting the forest-using industries appeared to be very serious and because an understanding of these conditions is essential to any progress in forestry in this country. We have undertaken this study with a view to getting the facts in regard to the ownership of private timber, the production of lumber, and the distribution of lumber and other forest products, and making them known to the whole country. We have undertaken the study with a constructive and helpful purpose in order to get the exact information necessary for rational forestry development. This study is getting directly at the problem of practical forestry on the private timberlands of this country and the conservation of its forest resources as a whole.

The CHAIRMAN. Doctor, I will make myself the goat on this question; I used to know it, but it seems that I am the only one who does not know it now: I would like to ask you to give the distinction between silvicultural and dendrological investigations.

Mr. GREELEY. The dendrological studies are really studies in tree botany. They deal with the identification of trees, the distinctions between species, and the botanical characteristics of trees. The silvicultural studies deal with the growing of timber for forest purposes.

The CHAIRMAN. One deals with the forest and the other with the individual trees?

Mr. GREELEY. Yes, sir.

Mr. MCLAUGHLIN. I would like to know whether you are doing anything in cooperation with the States by way of encouraging the enactment of laws to meet this situation. In some States—one that I have some knowledge of—where fine timber grew on land having doubtful value for agriculture, by the early methods of lumbering only the better timber was taken and the rest remained standing; but the lumbermen owning the land, having taken all that they wished, let the land go back to the State for taxes. Another person would come along and buy the tax title, cut the timber he wanted, and then let it go back to the State for taxes. The State would then sell that land again for taxes, and some one would come along and, the timber having increased in value, he would actually skin the land and let it go back to the State for taxes, and there it would remain, of very little value. Now, the States who did that were unwise. Michigan did it, and the result is that there are areas in that State now held for taxes that are of doubtful value for agriculture, I would say. Some think it is profitable to cultivate it, and some hold that a way can be found later to make it profitable to cultivate. Now, if that proceeding or anything like it is followed in other States, it seems to me that the eyes of the lawmakers ought to be opened to that situation, and they ought to take the land after the first cutting and hold it permanently under a system of forest management.

Mr. GREELEY. We have done all that we could, Mr. McLaughlin, to encourage the States to take up forestry work, including the establishment of State forest reserves. A number of States have initiated the policy of holding cut-over lands which are receded to the State for nonpayment of taxes as permanent State reserves, putting them under fire protection, and doing some planting on them. Some of the other States have purchased cut-over lands of little value and are holding and improving them in the same way. We have an Office of State Cooperation, conducted partly under this item and partly under the item for cooperative fire protection, which is giving constant study to these questions and aiding a good many States to work out their forestry problems. For instance, that office has compiled all the State forestry laws and is publishing them as fast as they can be gotten out. This is practically a codification of all State legislation in regard to forestry and forest reserves. We have been called upon in a great many cases to aid States in drafting legislation. I think the State of Michigan has set aside 300,000 acres of cut-over pine land which has come back to the State largely through nonpayment of taxes, and is treating it as a permanent forest reserve. The State of Wisconsin has also taken action along the same line. The State of Pennsylvania has a reserve of upward of 1,000,000 acres. So, you see, the policy has been begun.

Mr. MCLAUGHLIN. I always felt, or at least since I became interested in this question, that it would have been wise for us if our State had taken those lands after they were first cut over and after they first came back on account of nonpayment of taxes and had transferred the title to the agricultural college or to the university, the lands to be kept as a permanent forest reserve. After the first cutting

vas still a lot of good timber, which grew and improved in y and quality, and as the facilities for lumbering improved ce of lumber increased and the lands became quite valuable. at policy was not followed, and the result has been that they een sold a couple of times for taxes, and everything of any n the shape of timber or wood of any value has been removed.

HAUGEN. In reading over the note, under item 263, I see it is ed that three clerks and one translator should be transferred tatutory roll. What is the purpose of that?

GREELEY. Simply because those positions are primarily cleri- l since there appears to be permanent need for them the nat- ace seems to be on the statutory roll.

HAUGEN. I find that a number of clerks are to be transferred. hat answer can be given to that? It is absolutely contrary to icy heretofore pursued by Congress.

GRAVES. These were transferred to the statutory roll from m. I think I pointed that out when we were going over the art of the bill. This item has been reduced from $83,728 to , to correspond with the aggregate of the salaries transferred tatutory roll.

HAUGEN. There is no increase of salaries?

GREELEY. No, sir; it is merely a transfer to the statutory roll.

CHAIRMAN. Have you anything further, Mr. Greeley?

GREELEY. No, sir.

CHAIRMAN. Dr. Graves, we will take up the next item, 264, timating and appraising timber and other resources on the l forests preliminary to disposal by sale or to the issue of oc- permits and for emergency expenses incident to their sale

GRAVES. I would like to have Mr. Greeley present that item.

GREELEY. The greater part of this appropriation is used for pping and estimating of timbered land in the national forests aration for timber sales. I think on Friday you asked the n as to how much of the national-forest land had been cov- intensive mapping. The timbered areas mapped and esti- now total about 20,000,000 acres. We are continuing that nder this item, together with such statutory and general ex- noney as can be contributed to it, at the rate of a million or n and a half acres annually. It is probable that there are 110,000,000 acres of land in the national forests bearing com- timber, in addition to the areas containing alpine timber odlands needed for watershed protection but not of great cial value. So that, at the present rate, a period of 90 years required before this work of mapping and estimating timber- n be completed. The work costs from 4 cents to 25 cents per pending upon the density of the timber and the accessibility particular tract. The work done last year averaged 6½ cents . For this amount we get a detailed topographic map on a 4 inches to the mile and an estimate of the timber by species ducts—for instance, railroad ties, telephone poles, saw logs, ner products are estimated separately—together with com- formation on the condition of the timber, its maturity, its the presence of disease or insects; in other words, the facts we need to know before deciding upon the desirability of a

Mr. GREELEY. During the past fiscal year the amount of timber ›ld decreased about 30 per cent, as compared with the fiscal year reviously, which simply reflects the general depression in the lum-›r industry in the Western States.

Mr. HAWLEY. What about the prices you received for what you ›ld?

Mr. GREELEY. The prices kept up very well, indeed. That is partly matter of accident, depending on the particular areas included in ıe year's sales. Our average price was $2.48 per thousand feet for ıe timber sold, but that price was influenced by large sales of yellow ine made in the Crater National Forest in Oregon, which were of ıceptional quality and accessibility, and which brought a high price. 'uring the six months which have passed since the end of the fiscal ›ar, or until January 1, the sales have increased, reflecting again con-itions in the lumber industry. The cut under outstanding contracts ıs shown an increase of 9 per cent over the same period last year.

Mr. STEELE. How much actual money did you receive last year ›om the sale of timber and turn into the Treasury?

Mr. GREELEY. The receipts from the sale of timber were——

The CHAIRMAN. Let that question be a little bit broader, and let ıe ask Mr. Greeley at this point to put in the total receipts from ıe national forests in detail.

Mr. GRAVES. You should like to have that inserted?

The CHAIRMAN. Let him give it now.

TATEMENT OF MR. HENRY S. GRAVES, CHIEF OF THE FOREST SERVICE—Continued.

Mr. GRAVES. The total cash receipts during the past fiscal year vere $2,481,469.35.

The CHAIRMAN. Can you give it as compared with last year, now?

Mr. GRAVES. That represents an increase over the preceding year of $43,759.14. That, in turn, represents an increase of earnings over the year before that of $45,789.36. The increased earnings during the year before that were $282,663.95; the year before that the increased earnings were $140,263.49.

During the first six months of the current fiscal year in which we are now working, the receipts are approximately $200,000 more than during the same period of the last fiscal year.

Mr. STEELE. Then this is one branch of the Government that you are making a profit on; is that the idea?

Mr. GRAVES. This is a revenue-producing business.

Mr. STEELE. That is the kind of business I want to get into.

The CHAIRMAN. Can you give it more in detail; that is, the total for timber?

Mr. GRAVES. That is timber and everything.

The CHAIRMAN. Now, give it for timber.

Mr. GRAVES. During the last fiscal year the cash receipts from timber were $1,175,133.95; for grazing, $1,130,495; for other miscellaneous use of national-forest lands, $175,840.40.

The CHAIRMAN. What, in a general way, does that miscellaneous item include?

Mr. [illegible] That is over $50,000 for water-power purposes and the remainder comes under the ordinary use.

I would like to call the committee's attention to the fact that the bill which recently passed the House, the so-called Ferris water-power bill, transfers the jurisdiction over the water-power sites of the national forests to the Department of the Interior and makes another disposition of the receipts. We estimate that in a few years the receipts from these water powers at the present rates will be approximately $500,000.

Mr. McLAUGHLIN. The Ferris bill does another thing, by refusing to adopt an amendment. It appropriates to another service the moneys arising out of the use of lands within the national forests.

Mr. GRAVES. That, of course, will be an increased burden on the national forest receipts if no credit is given for those receipts. I think also that in the long run it will involve a very large increase in the cost to the Government by transferring to another department the jurisdiction over the water-power sites in the national forests, because under the present conditions, with the permanent organization of the Forest Service, a very large part of the expenditures necessary to the administration of water-power business in the national forests is carried by our regular force, and the transfer of jurisdiction will not result in a substantial decrease in our expenditures.

Mr. SELDEN. That will increase it?

Mr. GRAVES. It will increase the cost to the Government in the long run, certainly over $100,000. I think you estimated nearly $150,000, Mr. Merrill?

Mr. MERRILL. $150,000; yes.

Mr. GRAVES. Because it will be necessary to build up in the Interior Department a duplicate organization to handle the work which our organization is now handling. We feel that that transfer is unwise.

Mr. HAWLEY. Do these figures that you have given indicate the cash receipts turned into the Treasury or are there free uses included in those figures?

Mr. GRAVES. These figures which I have read indicate cash receipts. We have under the law authority to give away timber under certain circumstances; during the past fiscal year the value of the timber given away under free use was $206,464.13.

Mr. McLAUGHLIN. And you have authority also to sell some timber for less than the market price, on account of the situation of the persons buying it, have you not?

Mr. GRAVES. We have authority to sell timber to settlers at cost; in fact, I think the law directs us to do it. The commercial value of the timber sold under those sales at cost exceeded in the past fiscal year the actual cash receipts by $33,000, which would represent an additional credit, if the accounts were kept in that way.

Mr. HOWELL. How do you reach the question of costs?

Mr. GRAVES. The cost of administration——

Mr. HAUGEN. Will you give the profit and loss?

Mr. GRAVES. May I give one other item, and then turn to that?

There were also free privileges given for grazing, corresponding to the free use of timber, which if charged for would amount to $79,000 a year. In addition grazing is restricted on a good many other areas including certain watersheds of cities and towns; and we are

also withholding from use by domestic stock certain areas in the Yellowstone region and elsewhere, to provide a range for the elk herds. The possible receipts foregone by the Government through withholding lands from grazing for these various purposes would amount to about $44,000.

In addition to that, there are a good many other free privileges given, as they should be given free, which if charged for would amount in value to from $50,000 to $100,000 more.

The CHAIRMAN. What would that total be, Mr. Graves?

Mr. GRAVES. The figures that I have just mentioned make a total of close to $2,900,000, or, if the value of the free special-use privileges be put at $100,000 instead of $50,000, the total would be about $2,944,000. Precise figures would be somewhat theoretical, because we have never attempted to find out as a matter of fact just how much we could in fairness charge the public for all these varied uses, were we operating the forests on a profit-and-loss basis instead of on a public welfare, public service basis. The real truth is that, were we ordered to handle the forests as a strictly money-making proposition, charging as a private landowner would charge for all valuable uses and privileges and abandoning activities which are purely for the public welfare, we could pay our own way at once and show a profit besides. I have no doubt, indeed, that we could do even more. We could raise money enough to pay for our general public welfare activities as well as operating expenses, if we were managing the forests as private owners would manage them. But such talk is more or less in the air, because as a matter of fact we neither want to manage them that way nor could if we wanted to. The public would not stand for it. It would be the wrong thing to do.

Mr. LEE. I do not know whether this is the proper place or not. I am not familiar with your system of bookkeeping. I think under the Alaskan Railroad bill which we passed that they were given a right to get crossties and timber from the national forests. In your system of bookkeeping does the Forest Service or the forest item get credit for all the timber given away——

Mr. GRAVES. It never has.

Mr. LEE (continuing). As furnished the Alaskan Railroad?

Mr. GRAVES. In the case of the Alaskan Railroad it was specifically mentioned in the statute, as I recollect it, that credit should be given for that. There was very little timber cut under that law until the present fiscal year. We have received a telegram from the field that there had been cut so far about 172,000 ties on the Chugach National Forest for the Alaskan Railroad. That would be a value of approximately $5,733.

Mr. LEE. I think that in the end the total ought to show the profit in the Forest Service in this country.

Mr. MCLAUGHLIN. You will remember last year that we refused to let the timber and wood from the national forests be used by another department without pay to the Forest Service.

Mr. LEE. If we have got to give away everything we have, we will not know whether the forests pay or not.

The CHAIRMAN. We provided that so far as the use of the timber for the Navy is concerned that a book account must be kept.

[illegible]

[illegible]

[illegible]

(The statement referred to follows):

SCHOOL, ROAD, AND TRAIL MONEY FOR STATES FROM RECEIPTS FUND.

Under existing law, besides the 10 per cent of the receipts which is made available for expenditure by the Secretary of Agriculture in building roads and trails for the benefit of the public, another 25 per cent of the receipts is paid over to the States by the Federal Government for the benefit of county schools and roads. The amounts available under both the 10 per cent and the 25 per cent clauses of the law during the fiscal year 1915 and the amounts that will be available during the current year from the receipts of that fiscal year are shown on the following page.

Amounts available for States from forest receipts.

State.	School and road moneys paid to States, fiscal year 1915.	School and road moneys payable to States, fiscal year 1916.	Road and trail moneys expendable by Secretary of Agriculture, fiscal year 1915.	Road and trail moneys expendable by Secretary of Agriculture, fiscal year 1916.
Alaska	$14,092.09	$11,165.76	$5,876.83	$4,466.30
Arizona	63,398.34	59,807.89	25,359.34	23,923.16
Arkansas	9,983.19	8,738.93	3,993.28	3,495.57
California	65,701.84	67,611.87	26,000.73	27,044.74
Colorado	56,340.42	59,218.60	22,536.17	23,687.44
Florida	3,959.41	2,336.77	1,583.76	934.71
Georgia	108.44	77.36	43.37	30.95
Idaho	59,227.81	75,651.15	23,691.12	30,260.46
Kansas	1,207.72	1,357.33	483.09	542.93
Michigan	78.68	198.37	31.47	79.35
Minnesota	538.72	1,971.60	215.49	788.64
Montana	93,586.06	79,589.78	37,434.42	31,835.91
Nebraska	1,064.38	1,401.15	425.75	560.46
Nevada	16,894.47	16,244.53	6,757.79	6,497.81
New Hampshire	.....	137.09	.....	54.83
New Mexico	33,743.49	31,786.46	13,497.40	12,714.58
North Carolina	206.31	401.41	82.52	160.48
North Dakota	74.83	81.83	29.93	32.73
Oklahoma	638.87	759.77	255.55	303.91
Oregon	61,606.50	49,675.83	24,642.60	19,870.33
Porto Rico	.....	9.25	.....	3.70
South Dakota	14,469.77	12,988.11	5,787.91	5,195.25
Tennessee	20.64	94.35	8.26	37.74
Utah	37,601.15	48,675.96	15,040.46	19,470.38
Virginia	613.00	282.47	245.20	112.99
Washington	35,637.50	37,445.56	14,255.02	14,978.23
West Virginia	.....	1.91	.....	.76
Wyoming	28,578.50	43,086.86	11,431.40	17,231.75
Total	599,272.17	610,797.75	239,708.06	244,319.10

The States of Arizona and New Mexico received additional shares of national forest receipts for their school funds on account of school lands included within national forests, as follows: To Arizona, paid in the fiscal year 1915 from the receipts of 1914, $30,730.58, and payable from the receipts of 1915, $28,966.46; to New Mexico, paid in the fiscal year 1915 from the receipts of 1914, $9,890.94, and payable from the receipts of 1915, $9,311.87.

The CHAIRMAN. Gentlemen, are there any further questions on that item?

Mr. MCLAUGHLIN. I believe the Forest Service—so it is said, anyway—has a way of fixing the price for the sale of timber at less than or different from the prices obtained by private interests. Is that true; and if it is, what is the reason for it?

Mr. GRAVES. We do not have any different method from that employed by private individuals, except that we have it systematized and based on collected data instead of reaching conclusions by guesswork. The old-fashioned way of appraising timber was to send a cruiser into the woods, and he would make a general estimate of the

[illegible] and logging costs and turn in a report that it was worth so much a thousand. The only difference in the [illegible] that we work out more systematically how much timber there is on the ground, how much it will cost to log it, and then we have a record as to the value on the basis of definite data which we can stand up and prove.

Mr. McLAUGHLIN. Do you mean that private interests buying or [illegible] less knowledge as to the amount of timber [illegible] service has?

Mr. GRAVES. The old-fashioned method was a matter of reaching [illegible] judgment of the cruiser, often without much [illegible]

Mr. McLAUGHLIN. That may have been true years ago.

Mr. GRAVES. It is true to-day in a good many transactions; but the large companies are now using precisely the methods we are [illegible] many cases they have adopted the methods which the Forest Service has developed.

Mr. McLAUGHLIN. In that case, then that suggestion you make would really have no force, would it?

Mr. GRAVES. I do not understand you.

Mr. McLAUGHLIN. If the private interests are adopting your very methods and cruising the timber just as closely and as accurately as you do, what you say as to your reason for establishing a different price or a different method would hardly apply?

Mr. GRAVES. We do not establish a different price or use a different method from the most careful lumberman of to-day. I was contrasting the methods we use with the old-fashioned methods formerly used by private owners.

Mr. McLAUGHLIN. You understand, I do not charge that you have a different method, but the charge is made by others, and it is very helpful to us to have your answer.

Mr. GRAVES. Perhaps it would clear your mind to state very briefly exactly how we do reach the cost of stumpage in our sales.

Mr. McLAUGHLIN. I do not want to take up too much time of the committee.

The CHAIRMAN. I wish you would do that, Mr. Graves.

Mr. GRAVES. Mr. Greeley, will you state the manner in which we reach the price of stumpage for our timber sales?

STATEMENT OF MR. W. B. GREELEY, ASSISTANT FORESTER, FOREST SERVICE—Continued.

Mr. GREELEY. We start with the normal lumber market, believing that our appraisal should be based upon what represent normal conditions in the lumber market rather than either the extreme depressions or the extreme fluctuations upward. To do that we take the average lumber price in the locality where the timber stands for the last three years, getting a figure which represents the average lumber value during that period. That is our starting point. Our logging engineers estimate as closely as practicable the costs of logging and manufacturing the timber on the particular area that is in [illegible]. They estimate the investment for improvements and equipment that will be necessary to exploit that area. They include the

preciation of this investment in improvements and equipment as part of the operating expense, and, taking that item together with the operating cost, they make up the total costs of putting the lumber from this tract of timber onto the market. The difference between that cost and the average lumber price over the period of three years is the margin which represents, first, the stumpage due the Government, and, secondly, the profit due the operator. That figure is divided by allowing to the operator what we believe to be a reasonable margin for profit and risk on his investment. That usually ranges from 12 to 20 per cent on the average investment which will be necessary to exploit the tract. It is not clear profit, because in it is included whatever risk is assumed of bad seasons, bad markets, and all the other risks incident to the lumber industry, which are relatively heavy. The difference represents the stumpage value, which we charge for the timber.

The CHAIRMAN. Are there any further questions on that, gentlemen?

Mr. STEELE. That explains my thought. My idea was with reference to the difference in the price of timber. If they had an area of timber out away from railroad facilities, and all that kind of thing, and somebody wanted to take a contract for that particular area, because it was getting about that age when it was necessary to cut it, then you would take into consideration the expense that he would have in order to build a railroad to that area?

Mr. GREELEY. Exactly.

Mr. HOWELL. Is there a detailed statement filed in the department of those various items in connection with each particular tract offered for sale?

Mr. GREELEY. Yes, sir. All of these cost items are put in the form of an appraisal, which is approved by the Forester before the sale is authorized.

Mr. HAUGEN. Have you ever advertised any timber for sale?

Mr. GREELEY. Yes, sir; all tracts of timber worth over $100 are advertised before they are sold.

Mr. MCLAUGHLIN. What do you find finally, as a matter of fact, by comparing your prices with prices paid for property belonging to private interests?

Mr. GREELEY. You will have to take into account there, Mr. McLaughlin, our terms of sale. We require payment for timber only in small installments, as the timber is cut. There is no interest on deferred payments. The standing timber is not subject to taxation. There are two charges which the private owner must meet which do not apply to Government timber. We get advantage of that in our stumpage price, because those charges are not considered at all in the calculation of costs, and for that reason, taking timber of equal quality and equal accessibility, the price of Government timber tends to be a little above the price of corresponding private timber.

Mr. HOWELL. Do you require a minimum cut of timber annually in your contracts?

Mr. GREELEY. Yes, sir.

Mr. HOWELL. What is the time limit for the fulfillment of contracts?

Mr. GREELEY. That varies, of course, depending upon the amount of stumpage involved in the sale and the necessary period for its

practical operation. We have approved contracts that permitted as high as 20 years for the removal of the stumpage. The great majority of them extend over three, five, and eight years.

Mr. HAWLEY. Where they run for a period of years you reserve the right at definite times to readjust the prices?

Mr. GREELEY. We readjust the stumpage prices at fixed periods.

The CHAIRMAN. Whenever they leave a tract they can not go back? You require them to clean up as far as they go?

Mr. GREELEY. We require the cutting of all timber which is to be removed and slash disposal as they go.

Mr. MCLAUGHLIN. You speak of the terms of your contract as influencing the price upward. Is it not true that you require the logging to be done in such a way, particularly the cleaning up of the land, so there will be no danger of fire, and that those requirements would influence the price the other way?

Mr. GREELEY. Exactly.

Mr. MCLAUGHLIN. So that, after all, it would be about evened up?

Mr. GREELEY. It depends upon which factor figures up the greatest amount. Ordinarily the cost of our requirements does not equal the financial advantages arising from the terms of payment.

Mr. MCLAUGHLIN. It seems to me I have heard that the Government is selling its timber cheaper than private interests sell theirs.

Mr. GREELEY. I am very sure that that statement is not true, as applied to timber that is of the same quality and accessibility. There is a tremendous range in the value of timber, as determined solely by its marketing qualities and the differences in the cost of logging it. Take, for example, Douglas-fir stumpage in the Puget Sound region, which is sold as high as $3 a thousand feet. Currently there are other sales in the same locality as low as 75 cents a thousand. The difference is simply in the accessibility and quality. Taking timber of the same quality and accessibility, I am quite sure that the Government is not underselling.

Mr. MCLAUGHLIN. I am glad to have your answers, because they are interesting, and, besides, they will help us to meet inquiries on the floor and overcome objections.

Mr. STEELE. Is it a fact that the private individuals select the best timber?

Mr. GREELEY. Yes, sir; always.

Mr. STEELE. And therefore they could get a better price.

Mr. HAWLEY. I would like to ask Mr. Greeley one question: When we had one of the other bureaus here before our committee, the statement was made that they had been cooperating with you in the matter of disposal of waste in the forests—the limbs and the tops?

Mr. GREELEY. Yes, sir.

Mr. HAWLEY. And they stated they had devised a means better than the one you had been using. Have you learned anything about that new industry?

Mr. GRAVES. That was the Bureau of Plant Industry, probably, having reference to scattering the brush left.

Mr. HAUGEN. They maintained that leaving it on the ground was a cheaper way of destroying it than picking it up and burning it.

Mr. GRAVES. That may work in some cases, but we have not reached the point where it is conclusive that it can be applied in all cases.

Mr. HAWLEY. That is, trimming the limbs off and leaving them as they fall, and not piling them up with the tops?

RAVES. Yes.
AWLEY. Are you using that method?
REELEY. We are trying it out. There is another factor—of ger—that has to be taken into account. If you do not burn ff it remains a fire menace until it is rotted down.
OWELL. So far as I understand, your method of administer- national forests, as affecting the price of lumber, it is not lly different from what it would be if those forests were in ownership?
AUGEN. If the national forests belonged to individuals, so the people who use the lumber are concerned, the price of to them would be about the same as it is now?
REELEY. There is just this difference—that the Government, owning these public forests, can determine upon its own nd can reduce the price at any time it believes it necessary nt monopolistic conditions.
OWELL. At the present time you have not found it necessary e the price of stumpage?
REELEY. No, sir.
CLAUGHLIN. I think there is a great big difference in this If these forests were turned loose they would be snapped private interests in 20 minutes, and then where would the to?
RAVES. The timber which is sold each year by the Government e relatively little effect on the total lumber market.
UBEY. Mr. Graves, I came in a little late. Have you had ded to you the annual question, namely, how long will it be he forests of the country will be cut?
RAVES. I think that my statements before you came in about icits and prediction as to the annual increase of earnings over that point.
AUGEN. How long will it require to cover the first deficit?
RAVES. About five or six years on the forests and about four years more to cover the improvements and betterments and s for the classification of land, and that sort of thing.

ENT OF MR. HENRY S. GRAVES, CHIEF OF THE FOREST SERVICE—Continued.

HAIRMAN. Now, take up item No. 265, Mr. Graves.
RAVES. Item No. 265 was explained in considerable detail on It is divided into two parts, one being covered by Mr. representing about $17,000, and by Mr. Adams, representing nce.
HAIRMAN. Will you please summarize that briefly in the at this point?
RAVES. Yes, sir.
summary requested follows:)

R OF PROPOSED EXPENDITURES FOR THE FISCAL YEAR 1917 UNDER THE GEN- XPENSE SUBAPPROPRIATION FOR MISCELLANEOUS FOREST INVESTIGATIONS.

llotment from the miscellaneous forest investigations item for the office is $17,020. The work of this office comprises:
iew.—Trained scientific men, who are also good writers, prepare for on all manuscripts. These men not only review but also write Forest ublications. Three such men are provided for.

2. Drafting.—This [illegible] the handling of proofs and forms. It includes [illegible] preparation.

3. [illegible] Forest Service documents needed in current work [illegible] addressing, and mailing work.

4. Editorial and statistical work.—The preparation and circulation of loan [illegible] teachers, and others, and the development and [illegible]

5. Lantern-slide [illegible] of the lantern-slide collection.

6. Forest Service [illegible] work for illustrative and for [illegible]

7. [illegible] information regarding [illegible] Forest Service.

[illegible] for the miscellaneous forest investigations item for the [illegible] The work of the office comprises:

1. Records.—This is the central repository for maps, diagrams, statistics, [illegible] of the National forests and property in general throughout the [illegible] The largest and most important part of the atlas consists of the national forest folios, of which there is one for each national forest, containing all maps and other graphic data pertaining to the particular forest. Additions and corrections [illegible] these graphic records as a result of surveys [illegible] in the field in connection with the transfer of [illegible] are provided for.

2. Drafting.—Maps [illegible] the Forest Service is of two general kinds: [illegible] made by the General Land Office or the Geological Survey, [illegible] reconnaissance, strip surveys, or cruisings made by the Forest Service [illegible] with the management of the forests. The [illegible] in the field is done outside of Washington, but there is [illegible] based on the records of the General Land [illegible] and plats of pertinent bureaus in Washington which necessitates the maintenance of a drafting force in the Washington office. This is largely in the nature of a compilation of a routine process. In addition to the salaries provided for this work this fund provides for one [illegible] and [illegible] It also covers the cost of lithographed forest atlas sheets, of which about 120,000 copies were made during the last fiscal year.

3. Photographic laboratory.—This is equipped for all classes of photographic work, including wet and dry plates, pictures and map prints, blue prints, vandykes, enlarged transparencies and bromides, and lantern slides. In it are prepared originals for illustrations, photographs, and wash drawings for halftones, and line drawings for zinc etchings; also transfers from map negatives to stone for lithographic proofs. A part of the work of the laboratory is devoted to illustrations for publications and for general information on the subject of forestry. The largest amount of work is in connection with the photographic reproduction of maps and diagrams used in carrying on the work of the Forest Service. The principal cost of conducting the laboratory is in statutory salaries, and but a small part of the item is used for miscellaneous expenses.

The CHAIRMAN. Now, take up item No. 266.

Mr. GRAVES. Item No. 266 was also discussed with a good deal of detail last Friday.

Mr. MCLAUGHLIN. With reference to 266, do you find that proviso which limits in a way and forbids the agents of the bureau traveling around and taking part in meetings and so on, embarrassing to the service, and does it meet with very much opposition?

Mr. GRAVES. This proviso, "that no part of the money herein appropriated shall be used to pay the transportation or traveling expenses of any forest officer or agent except he be traveling on business directly connected with the Forest Service," etc.?

Mr. MCLAUGHLIN. Yes.

Mr. GRAVES. No; because all the work that we send them out on naturally is connected with the business of the Forest Service.

Mr. MCLAUGHLIN. But that has limited, has it not, the activities of the service?

Mr. GRAVES. Mr. Adams, will you tell the committee whether generally, so far as you know, that has acted in any way to the embarrassment of the service?

Mr. ADAMS. No; it has not had any material bearing or effect.

Mr. MCLAUGHLIN. Perhaps I did not use the right word. It may not "embarrass" the Service, but formerly there were a great many requests made for men to take part in meetings, to talk about forestry, and to help explain, and I wished to know if you had been able to meet the many requests that are made now?

Mr. GRAVES. I think the item you have in mind was in another bill.

The CHAIRMAN. That is an item in the District of Columbia appropriation act for the fiscal year 1913, which reads as follows:

SEC. 8. No money appropriated by this or any other act shall be expended for membership fees or dues of any officer or employee of the United States or of the District of Columbia in any society or association or for expenses of attendance of any person at any meeting or convention of members of any society or association, unless such fees, dues, or expenses are authorized to be paid by specified appropriations for such purposes or are provided for in express terms in some general appropriation. (37 Stat., pt. 1, page 184.)

Mr. GRAVES. I think, Mr. McLaughlin, so far as meetings are concerned, that the limitations upon our funds would be such that we could not be able to do much beyond what we do now. We have authority under the law to attend meetings of stock associations and organizations cooperating with the Forest Service and meetings of a public educational character.

The CHAIRMAN. If there is nothing further on that item, take up No. 267, amounting to $15,000.

Mr. GRAVES. This item was inserted to permit the use in the city of Washington of some of the funds appropriated for the purchase of lands in the Appalachian and White Mountains, on account of the comptroller's decision that the moneys appropriated for the purchase of lands could not be used in the city of Washington. It may be, Mr. Chairman, that in that connection it would be well to make a brief statement regarding the organization of the work in the Forest Service of examination, appraisal, and survey of the lands considered for purchase, with particular reference to the fact that the expiring funds for purchase would very much affect our organization, and with your permission I would like to ask Mr. Hall to make a brief statement in regard to what our organization for that work is.

The CHAIRMAN. We will be very glad to hear you, Mr. Hall. I would like to say, Mr. Hall, we would like to finish this bureau by 12.30.

STATEMENT OF MR. WILLIAM L. HALL, ASSISTANT FORESTER, FOREST SERVICE.

Mr. HALL. Mr. Chairman, the committee will recall that the act of March 1, 1911, places certain responsibilities upon the Department of Agriculture, upon the Geological Survey of the Interior Department, upon the Department of Justice, and upon the National Forest Reservation Commission which was created by that act.

In organizing the work the Forest Service was assigned the work of receiving the proposals of land, of appraising the values of land,

of preparing reports showing the appraised value of the tracts examined, and, after the approval of land for purchase by the National Forest Reservation Commission, of making the surveys of the tracts. The force as at present organized in the Department of Agriculture contains some 82 persons. These are divided roughly into timber estimators, surveyors, and title examiners. We have, I believe, 19 men in the timber-appraisal work, and 22 in the survey work, which includes the men in charge of the survey parties and transit men who run the instruments.

The Solicitor of the Department was assigned the work of making examinations of titles. His men go into the county offices and make the examinations necessary for a report to the Attorney General upon the title for each tract. The Solicitor's present force includes 15 title attorneys and 19 stenographers. Of the force of 81 there are 7 engaged in the city of Washington during the present fiscal year.

This $15,000 item which is before the committee now pays the salaries of those seven persons. The pay for the seven, however, amounts to only $11,400, and there are also paid under the authority given in this item two salaries or parts of salaries from the appropriation for cooperating with the States in fire protection. That is another item, but it was begun in the Weeks law, and it is affected by this item which allows $15,000 for service in Washington.

The CHAIRMAN. Mr. Hall, will you please include in the record a list of these various employees, with their salaries?

Mr. HALL. I shall be glad to do so.

(The statement mentioned follows:)

Employees under the Weeks law paid from the allotment of $15,000 for salaries in the city of Washington.

	Per annum.
1 forest inspector	$2,500
1 examiner of surveys	2,100
1 examiner of surveys	1,600
1 forest examiner (part time)	1,100
1 chief, State fire cooperation (part time)	1,300
1 clerk	1,600
3 clerks, at $1,200 each	3,600
Total	13,800

(The salaries of the forest examiner and the chief, State fire cooperation, amounting to $2,400, are payable not from the purchase fund but from the fire cooperation fund.)

Employees in the Field Service, Department of Agriculture, under the Weeks law.

EXAMINATION OF LANDS.

	Per annum.
3 timber estimators:	
2 at $2,200 each	$4,400
1 at $2,000	2,000
14 forest examiners:	
1 at $2,000	2,000
1 at $1,600	1,600
3 at $1,400 each	4,200
9 at $1,300 each	11,700
1 forest assistant:	
1 at $1,100	1,100

SURVEY OF LANDS.

	Per annum.
11 examiners of surveys:	
1 at $1,500	$1,500
9 at $1,400 each	12,600
1 at $1,200	1,200
9 transitmen:	
4 at $900 each	3,600
5 at $840 each	4,200

TITLE EXAMINATIONS.

15 title attorneys:	
2 at $2,200 each	4,400
1 at $2,000	2,000
3 at $1,800 each	5,400
5 at $1,680 each	8,400
4 at $1,500 each	6,000
19 stenographers:	
3 at $1,200 each	3,600
7 at $1,000 each	7,000
9 at $900 each	8,100
Total	95,000

The CHAIRMAN. Would this $15,000 be necessary if Congress should act unfavorably on the proposition to extend the provisions of the Weeks law?

Mr. HALL. A portion of this $15,000 would be necessary for a time, in order to clean up the work which is yet ahead. A good many of the titles have not been finished; some of the surveys have not been finished.

The CHAIRMAN. What portion of it do you think would be necessary?

Mr. HALL. I would say, Mr. Chairman, that the limit had better stay as it is, because anything that is saved here remains in the purchase fund anyhow.

Mr. ADAMS. This is not an appropriation; it is authority to spend in a certain way money which has already been appropriated.

The CHAIRMAN. Authority to spend money out of the Weeks appropriation?

Mr. HALL. That is all I have to say in explaining that item, Mr. Chairman.

The CHAIRMAN. Do you have the item on page 212 of the Book of Estimates, Mr. Hall—the one for cooperation with States?

Mr. HALL. No, sir.

The CHAIRMAN. How much money have you left out of that Weeks fund, Mr. Hall?

Mr. HALL. I should be glad to make a statement on that point. At the general hearing on January 28 that question came up, and since then I have revised the figures, so I can give them to the committee if you wish.

The CHAIRMAN. We would be very glad to have you do it.

Mr. HALL. The appropriation for 1911 of $2,000,000 mentioned on last Friday reverted to the Treasury, except $17,320.76. That was money which was used in the examination of lands and in the preparation of reports on lands for the National Forest Reservation Commission. To that is to be added appropriations for the years 1912, 1913, 1914, and 1915, at $2,000,000 a year, making $8,000,000. The total of purchase fund, therefore, has been $8,017,320.76.

The National Forest Reservation Commision has had reported to it, and has approved for purchase, 1,322,589 acres. Of that amount, 77,753 acres had not by the 1st of January, 1916, been surveyed; surveys were in progress, but they had not been completed. They had been completed on 1,245,727.4 acres, and that acreage shows a shrinkage from the approved acreage of 43,106 acres.

The commission at the very beginning of its work decided that it would accept no land except upon the basis of a survey made by horizontal measurement, the same as in the case of public lands. To a certain extent the shrinkage in acreage is due to this accurate method of surveying. Very generally in mountain surveys the measurements have been on the surface, running up and down the slopes. Reducing these to a horizontal plane results in a shrinkage. Some of the shrinkage, however, is due to the fact that some of the tracts have never been surveyed, and were simply carried under nominal acreage.

The lands which have been surveyed, therefore, and the lands which have not as yet been surveyed give us a total of 1,279,482 acres, which involve a liability of $6,778,039.37; that is the total liability for the purchase of land. It includes also the payments that have already been made.

Up to June 30, 1915, all the work connected with purchase, including supervision, appraisals of the timber, valuations of the land, surveys to determine the acreage and to make necessary maps, and in addition all title work, has cost $743,112.60.

Mr. HOWELL. How much an acre is that?

Mr. HALL. Upon the basis of the acres surveyed it would be about 58 cents per acre. The estimated cost for these several lines of work to June 30, 1916, is $169,000, making a total estimate for examinations, appraisals, surveys, and title work of $912,112.60. Adding this to the liability for lands contracted for or purchased, we have a total of $7,690,151.97. Taking this amount from the total available fund of $8,017,320.76, we have an indicated balance of $327,168.79 at the present time.

There will be some change in this figure, because the 77,000 acres which have not yet been completely surveyed will be something different from that when the surveys are completed. There will either be a gain or a loss, so that the balance will vary from the figures now indicated.

We now have under option or are well advanced in our negotiations for lands sufficient to take up the entire balance of $327,000. It is our plan to use up this money before the end of the present fiscal year. Therefore, if no further appropriations are made by Congress at this session, this work will cease, except such surveys and title examinations as have not been completed, and the force which has been assembled and trained for this work will then either be separated from the service or transferred to other lines.

The CHAIRMAN. Is there anything further?

Mr. HALL. I should like to say something about that force, if the committee would be interested in it.

When this work began, in 1911, it was the first work of this kind that had been done. We found the necessity, therefore, of getting together and training a force for it. First, we had need of timber examiners and expert lumbermen to make the appraisals. That part

of the force was gathered together. By that time we were recommending the purchase of lands to the National Forest Reservation Commission, and the commission approved certain tracts for purchase. We then had need to gather together and train a survey force, and that was done. I wish to say that the training of a survey force for handling the very intricate survey work which we had to do, in the southern mountains especially, was a long and tedious process. It took about two years to get that work running smoothly. At the same time that we were doing the survey work it became necessary to take up the title work, and that force was organized. It was the last part of the force which was organized, and it is the force which will finish its part of the work last, because the finishing up of the title is always the last step in the purchase of any tract.

This is an efficient force at this time. It has been built up to the point of being able to handle the work so fast as it could be carried on with the appropriations of $2,000,000 a year made by Congress. Our experience in handling the purchases indicate that, so far as the Appalachian region and the White Mountain region are concerned, $2,000,000 a year is about the right amount to work with. We have designated some 20 purchase areas, and have made purchases in 16 of them. In some of them we have only barely begun purchases, while in others we have perhaps two-thirds of the land that ought to be acquired, so that the work is in various stages of completion.

Mr. McLAUGHLIN. So that you have been in a way anticipating appropriations and done some work and spent some money that will be lost if another appropriation is not made?

Mr. HALL. That is necessarily the case. When a tract of land is offered and we find its situation and character satisfactory and a reasonable price is made on it, we make the examination and appraisal of it. It has turned out in a great many cases that we were not able to buy the land immediately. In some cases owners have waited for two or three years before accepting the price we were willing to recommend. In some of the cases we have examined land where the owners have not yet accepted the prices we are willing to recommend. We have, I believe, examined something over 2,000,000 acres of land, while only 1,320,000 acres have been recommended for purchase, so that over 600,000 acres have been examined which have not yet been bought.

Mr. McLAUGHLIN. That is very likely land which would not be bought if we had money?

Mr. HALL. No, sir; that is practically all land that will be bought when we can reach terms with the owners if money is available. We do not examine land unless the tracts lie right and are of the right kind.

Mr. HOWELL. It first has to be examined and surveyed, I understand?

Mr. HALL. Yes.

Mr. HOWELL. The cost you have estimated to be 58 cents includes the cost of the work of the Geological Survey?

Mr. HALL. Yes, sir; it does. In the laying out of the purchase areas and in carrying on purchases within them we have used the utmost care to keep the purchases consolidated as best we can. We have limitations, however, upon us in doing that. If we had used

condemnation proceedings going out and drawing a line around certain sections of country, we could block it up as we go: but we have practically avoided condemnation. We have bought lands only where they are offered for sale.

Mr. HOWARD. Is your commission the same as when it was first made up or have some retirements from office made new appointments?

Mr. [illegible] There has been no change, except the change in Cabinet members.

Mr. [illegible] What is the record the total cost per acre of the [illegible]

Mr. [illegible] Yes, sir. The cost to the 30th of last June was $5.24 per acre, with a general charge of 58 cents per acre for examination. These costs are based on the acreage acquired.

Mr. HOWARD. What elements of value are taken into consideration in fixing the purchase price of the land: is it the timber?

Mr. [illegible] The timber and the land, and in a few cases improvements [illegible] upon the land.

Mr. HOWARD. Minerals also?

Mr. [illegible] We have some minerals in certain cases. The basis of value is practically the land and the timber. In certain cases we have [illegible] where there seemed to be some slight mineral deposits, and in those cases sometimes it would be necessary to place a value of 10 cents or 25 cents an acre on the minerals.

Mr. HARRIS. Is the value of the timber taken into consideration?

Mr. HOWARD. All value—timber, land, minerals, etc., are taken into consideration.

Mr. HARRIS. The land with a timber value is bought in preference to one without timber value?

Mr. HALL. The price, of course, varies according to the value of the tract.

Mr. HARRIS. I am speaking of the policy of the commission or this Government in purchasing land and paying 100 cents on the dollar, and then turning in about 15 cents to the State treasury.

Mr. HALL. The figures that I will give will answer the question best, I think. Twenty-eight per cent of the land which has been bought is virgin timberland. About 50 per cent has been cut over more or less. Some of it very lightly cut.

Mr. HARRIS. And not considered to have any timber value?

Mr. HALL. It has timber value, but has been to some extent cut over.

Mr. HARRIS. Now, the other land: you say 28 per cent was denuded land?

Mr. HALL. Twenty-eight per cent is virgin timber, and about 50 per cent is more or less heavily cut, some portions of it being cut clean, while in other portions only the more valuable trees, such as yellow poplar and white oak, have been cut; looking over the stand you would not think there had been much cutting. On 11 per cent of the lands the timber has been reserved by the vendor. The prices paid for lands under that condition correspond pretty closely to the prices paid for cut-over lands. Where the timber is reserved it is not reserved permanently, but always for a limited number of years, generally for less than 10 years, and the cutting is done under the rules and regulations prepared in the department and agreed to in advance and made a part of the instrument of conveyance.

The prices paid for tracts vary with their accessibility, condition, and amount of timber. The amount of timber has more to do with the price than anything else. Cut-over lands have in almost all cases been bought for less than $3 per acre. The minimum price paid was $1.09 per acre, while a considerable acreage was acquired at $1.25 per acre or less, and 97,620 acres have been acquired at $2 or less per acre. The highest price paid in any case was $15 per acre in the case of a very accessible tract covered in large part by a heavy stand of valuable spruce timber. It may be interesting to the committee to know that the purchases have included 766 tracts, of which 446 were under 1,000 acres in extent, 91 contained between 1,000 and 10,000 acres, and 29 had over 10,000 acres. The largest tract acquired contains 80,398 acres, while some of the smallest contain less than 10 acres.

Mr. HAUGEN. Do we understand that it is the policy of the Government to buy lands of no value to the owner, instead of doing as they do in Michigan, as referred to by Mr. McLaughlin, let it go at tax sale, and in that way save $5.34 an acre that would otherwise go to tax sale and the owner realize nothing out of it?

Mr. HALL. These lands are not going back to the State, but are being held.

Mr. HAUGEN. They are not now, because the Government takes them over, the Government enters the market; but would it result in the same way if the Government did not purchase and let it go to the tax sale?

Mr. HALL. In the East, even in the mountain country, there is but little land which reverts to the State. That land is held. The timber keeps coming up on it. We have a different kind of timber on these eastern lands than is the case in Michigan. There they have pine forests; here we have hardwoods which are not so easily killed out. Fire, for instance, may kill the trees, but not the roots; and the young growth will come up from the roots.

Mr. HAUGEN. One of your witnesses let the cat out of the bag when he made the statement that Vanderbilt had bought a tract of land at $1.50 an acre and sold it to the Government at $6 or $7 an acre, making three or four hundred per cent profit. Is it not a fact that, because of the activities of the Government in the market for land, the private land has increased in value materially; and that, if it were not for the Government entering the market, a lot of it would go to tax sales?

Mr. HALL. I think it is not the case that the activities of the Government have increased the prices of forest land. It is true that the Government paid $5 an acre for portions of the Vanderbilt Pisgah Forest tract, including 13,000 acres of unlumbered forest. The timber alone on other portions of this tract was recently sold to a lumberman at $12 an acre. The Vanderbilts purchased this property 20 years ago.

Mr. HAUGEN. Why, then, should that be different in the case of Michigan? As I understand from Mr. McLaughlin, there is a large percentage of it sold at tax sales.

Mr. MCLAUGHLIN. I do not know how large a portion.

Mr. STEELE. That is poor land; this is good land.

Mr. MCLAUGHLIN. There are areas of that kind of land is Michigan, though.

Mr. [illegible] Minnesota, I understand.

Mr. [illegible] The character of the forest has much to [illegible] where the land has been cut over [illegible] as Mr. McLaughlin described. [illegible] there is virtual denudation. In the [illegible] that is not true. We have forests of [illegible] there, and fire does not kill [illegible] kills the tree, but does not kill the [illegible] constantly.

Mr. [illegible] purchases from the States?

Mr. [illegible] purchases from the States. The [illegible] eastern mountains. The States of [illegible] to have yet certain small [illegible] surveys brought out [illegible] few tires or sometimes as much as [illegible] the States, and we have not [illegible] would buy them from the States.

Mr. [illegible] waste of money to buy them!

[illegible] ought to be largely interested. [illegible] of the State having the land is [illegible] for the same purpose for which [illegible] the whole thing ought to be [illegible]

Mr. Haugen. I [illegible] does the State cooperate with the department in the purchase of these lands?

Mr. Hart. The States are not cooperating with the Government in the purchase of these lands. This is carried out purely as a Federal project. The work which is being done, however, has clearly been influential [illegible] number of States into active measures for the preservation of forests. Virginia, West Virginia, Kentucky, North Carolina, and Tennessee have all taken active steps toward passing forest laws since this work has been going on, and I am sure that the work which is being done has been instrumental in leading those States into that kind of activity. Several of them are cooperating with the Federal Government under the cooperative arrangement for protecting watersheds.

The Chairman. From fire?

Mr. Hart. From fire.

Mr. Haugen. I would like to ask Mr. Graves just one question, and that is: If appropriations are to be made in addition to those made March 1, 1911, would it not be wise to make them for the protection of all watersheds of navigable streams? Why apply them to this alone?

Mr. Hawley. The law now contemplates that you can buy land anywhere in the United States under the act.

Mr. Haugen. Have any been bought outside the Eastern States?

Mr. Hart. No.

Mr. Haugen. Would it not be a wise policy to give more attention to the more important projects approved by engineers of the War Department? Are these considered the most important projects?

Mr. Graves. It was generally understood that that appropriation was primarily for the purchase of these lands in the eastern mountains. [illegible] was clearly the understanding in the hearings on the

original bill, and that was the interpretation of the purpose of Congress in passing the law, although the language of the law was made general.

The CHAIRMAN. That is true.

Mr. HAUGEN. What reasons have there been for not giving more attention to other sections of the country?

Mr. GRAVES. I think it would be unfortunate to scatter the fund too much, and with an amount such as was appropriated it would be better to begin in a region more restricted, such as this, and build the forests up there. As far as the far West is concerned, it was thought that the forests already owned by the Government were very considerable there.

Mr. HAUGEN. Are we to understand that it would be necessary to bring people here in order to show those in charge their interest in those projects, and in order that those projects might receive consideration in other sections of the country?

Mr. GRAVES. I think this first appropriation was always interpreted by the commission as being applicable to these eastern regions. Was not that your understanding, Mr. Hawley?

Mr. HAWLEY. Yes.

Mr. GRAVES. And it was confined to this region entirely. No plans were made at any time for extending it outside of that.

Mr. HAUGEN. For instance, the Mississippi River, referred to in the hearing, is one of the most important projects on the program for the improvement of waterways. At least, it has been approved by the engineers of the War Department and is generally recognized as the most important project. I was interested to know if any attention had been given to that.

Mr. HAWLEY. The question, I think, would be whether the watershed of the Mississippi River had been so impaired by the cutting of timber or other means that the flow of the Mississippi has been reduced or made periodically larger or smaller due to that fact of the activities of the timber cutters on the watershed. That never has been brought up.

Mr. HAUGEN. It has been considered of sufficient importance so that the War Department has deemed it necessary to expend $20,000,000 and make it a 60-foot channel. I am not contending that this is because of it, but Congress has thought it wise to authorize the spending of that sum.

Mr. GRAVES. You will remember that the conditions in this bill were that the State should pass legislation authorizing the Government to purchase land, and that has been done only in the Eastern States. That would be a condition of the purchase. So far as the acquisition of forest lands at the headquarters of navigable streams elsewhere is concerned, my own personal judgment is that they should be owned in large part by the public, either the National Government or the States.

Mr. HAUGEN. Do I understand that purchases can be made at the suggestion of the States?

Mr. GRAVES. That is the law.

The CHAIRMAN. Is there anything further in that item, Mr. Hall?

Mr. HALL. I would like to make one further statement, Mr. Chairman. We have evidence that these purchases are actually doing a great deal of good. I have mentioned the activities of the States in

[illegible] protection. We find that we are able to control fires upon these [illegible] that we are expected to do. We know that these [illegible] are being carried almost every year, but [illegible] situation in hand in these lands which are being all controlled [illegible] we find that to a very large extent fires can be stopped. [illegible] The loss caused over here each year is [illegible] the total acreage. Now we find that many of [illegible] are willing to join hands with us. They are beginning to see the desirability of the protection of their [illegible] and are willing to act on suggestions that they can [illegible] We find that a decided change in sentiment [illegible] themselves in regard to the [illegible] Formerly it was the thing to burn the woods every year. There has been a vast change in sentiment on the part of the people [illegible] We find that it is burning the woods is not a good thing. We have been able to help the communities in many other ways. We find that there are one of the best kind of men to cooperate with; they are efficient officers, they work well with us; they are good business men, and that they really the suggestions we are making [illegible] of the value of the forests. They are taking an interest in the protection and development of the Government lands and they feel that we are taking the things we are trying to put into effect on our lands and appropriating them for their use. I feel very much encouraged at the fine spirit of cooperation and readiness for improvement that these people have shown.

STATEMENT OF MR. W. B. GREELEY, ASSISTANT FORESTER, FOREST SERVICE—Continued.

The CHAIRMAN. Will you take up the new item [illegible] that hereafter deposits may be made of funds under purchases in such sums as the Secretary of Agriculture may require, etc.?

Mr. GRAHAM. I will ask Mr. Greeley to discuss that.

Mr. GREELEY. This is not an appropriation, Mr. Chairman, but simply a grant of authority to the Forest Service to accept deposits from timber purchasers and place them in the Treasury, to be expended for the cleaning up of slashings and other debris following the cutting of timber on the national forests. All lumbermen operating in the forests are required to dispose of slashings resulting from their cuttings, so as to prevent a fire menace. It is often difficult to have this work done satisfactorily by the lumber operator himself, and he often desires to have the Government take the responsibility off of his hands in meeting these requirements. The most effective way to do this would be to have the operator deposit with the Government the cost of the work and then let that money be expended by the Forest Service through its own field organizations. This item is designed to give us the requisite of authority to carry out that system. It would be voluntary on the part of the operator—that is, we would not force him to dispose of his slashings in this way if he preferred to do it himself—but in a great many cases our purchasers would be glad to put that work in our hands and pay the cost of it, and let us do it in the right way.

Mr. MCLAUGHLIN. Would not that result in the employment of a number of extra men?

Mr. GREELEY. Yes, sir; it would employ men temporarily—usually for periods of a week or two at a time.

Mr. MCLAUGHLIN. I suppose a good many men are employed temporarily; but would not this result in the employment of a good many men who would be employees on this service permanently?

Mr. GREELEY. No, sir; because our present organization of rangers and lumbermen on our permanent rolls would be adequate to handle this work. We have experienced officers in charge of every timber sale, and they would be the foremen to direct this brush disposal.

The CHAIRMAN. You mean to say it would not cost the Government anything at all, except the bookkeeping?

Mr. GREELEY. Except the bookkeeping and such incidentals.

Mr. HAWLEY. Where you take the work over from the contractor you relieve him of the danger that he might run in case fire broke out in disposing of it?

Mr. GREELEY. Yes, sir.

Mr. HAWLEY. He shifts the burden from himself to you?

Mr. GREELEY. We accept the responsibility of disposing of those slashings properly.

Mr. MCLAUGHLIN. What do you mean by "accepting responsibility to dispose of those slashings properly"? If there is any question about it being properly done, you mean you meet that loss and reimburse him for the loss?

Mr. GREELEY. There would be no reimbursement due the contractor under any circumstances. It would mean simply this, Mr. McLaughlin, that if fire should break out and burn Government timber in the course of the disposal of these slashings and the work had been done by our men the responsibility for damage to the forest would not rest upon the contractor. Furthermore, by paying this money to the Government he would be discharged from further responsibility—under the contract clauses which require brush disposal.

Mr. STEELE. In doing that you would increase the price of the timber; you would get a better price for it, would you not?

Mr. GREELEY. I do not know that it would affect the price. The contractor, under any event, has to meet the cost of proper shash disposal.

Mr. HOWELL. Do you have any difficulty now in having contractors comply with your requirements in cleaning up this underbrush?

Mr. GREELEY. The only serious difficulty that occurs is this: The brush is almost always burned, and that burning must be done at just the right season of the year. Often the time is reduced to a matter of one or two weeks within which the conditions are right to get clean burning without running the risk of starting forest fires. We have had difficulty at times in getting the timber operators to dispose of their brush at just the right time of the year.

Mr. HAUGEN. This arrangement will give right disposal?

Mr. GREELEY. Proper disposal.

Mr. HOWELL. You have to go to a contractor where the work has not been done rightly and have to do it over again?

Mr. GREELEY. That has occurred at times, but we have eliminated it very largely by keeping very close watch of the work, so as to avoid the cost of going over it again.

Mr. HOWELL. And this is primarily for the convenience and benefit of the contractor.

Mr. GREELEY. For the convenience and benefit of the contractor, and also the benefit of the Government in making sure that the work will be properly done.

Mr. STEELE. Here is the point: If you do the work, then he should pay more for his timber.

Mr. GREELEY. He pays the cost of this work, sir. He must pay into the Treasury an amount of money for this particular purpose, estimated to cover the cost of the work.

The CHAIRMAN. You recommended the insertion of this provision last year, did you not, Mr. Greeley?

Mr. GREELEY. Yes, sir.

Mr. MCLAUGHLIN. Under this method there is no cost to the Government, the entire expense being covered by the deposits made by the purchasers of timber?

Mr. GREELEY. Yes, sir.

Mr. HAUGEN. Will that include overhead charges?

Mr. GREELEY. I do not think there will be any overhead charges. We have the supervising officers on the job now.

The CHAIRMAN. On page 212, item 2, "for cooperation with any State or group of States for the protection of fire of forested watersheds of navigable streams," $100,000 is appropriated for cooperation with States under the Weeks law. There is no change in that, but, briefly, what did you do and what have been some of the results?

Mr. GREELEY. Under that item we are now cooperating with 20 States, Mr. Chairman, in the protection of forested watersheds from fires. We are protecting approximately 13,000,000 acres. The money is used for the employment of about 300 men as patrolmen in the field during the fire season. The States are spending about five times as much as the Federal Government, and the States and private owners combined, who are both cooperating with us, probably spend, all told, $1,000,000. So that the sum made available by this item is multiplied by 10 through the cooperative assistance received from the States and private owners in this work. We have found this cooperation of especial value, because it enables the Federal Government to take the leadership in fire protection and to develop and systematize the protective work of the States and private owners. For this reason and also because of the obligation recognized by the Federal Government to aid in the protection of navigable streams, I feel that this work should be continued permanently. Probably three additional States will cooperate with the Forest Service in 1916.

The CHAIRMAN. Are there any questions, gentlemen? Mr. Graves, is there any reason why this item 2 should not be transferred back to the Forest Service appropriation?

Mr. GRAVES. No reason that I can see.

The CHAIRMAN. I do not see any reason for not transferring it.

The committee will now take a recess until 3 o'clock this afternoon, at which time we will hear Dr. Alsberg, of the Bureau of Chemistry.

(Thereupon, at 1 o'clock p. m., the committee took a recess until 3 o'clock p. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Friday, January 28, 1916.

The committee met at 10 o'clock a. m., Hon. Ezekiel S. Candler, jr., presiding.

Present: Hon. Locke Craig, governor of North Carolina; Mr. Henry S. Graves, Chief of the Forest Service, United States Department of Agriculture; Mr. William L. Hall, Forest Service, Department of Agriculture; Mr. A. H. McConville, office of the Solicitor, Department of Agriculture, Washington, D. C.; Mr. George Otis Smith, Director United States Geological Survey; Mr. Allen Hollis, of Concord, N. H., representing the State of New Hampshire, the Society for the Protection of New Hampshire Forests, and the Connecticut Valley Waterways Association; Hon. John W. Weeks, United States Senator from Massachusetts; Mr. Joseph Hyde Pratt, of Chapel Hill, N. C., State geologist of North Carolina, representing the North Carolina Forestry Association; Mr. Harvey N. Shepard, of Boston, Mass., representing the Appalachian Mountain Club; Mr. George S. Powell, of Asheville, N. C., representing the Appalachian Park Association; Mr. Harold M. Parker, of Boston, Mass., chairman of the Massachusetts Forestry Commission, representing the State of Massachusetts; Mr. I. C. Williams, deputy commissioner of the State of Pennsylvania, representing the State of Pennsylvania; Mr. W. I. Tilley, of New Haven, Conn., representing the Connecticut Forestry Association; Mr. John S. Ames, of Boston, Mass., representing the American Forestry Association; Mr. Frank M. West, of Springfield, Mass., representing the Western New England Chamber of Commerce; Mr. R. C. Bryant, of New Haven, Conn., professor of lumbering, Yale University, representing the State of Connecticut; Mr. John H. Finney, of Washington, D. C., representing the Southern Commercial Congress; Mr. P. S. Ridsdale, of Washinton, D. C., executive secretary of the American Forestry Association; Mr. Philip W. Ayres, of Boston, Mass., representing the Society for the Protection of New Hampshire Forests; Mr. Allen Chamberlain, of Boston, Mass., representing the Massachusetts Forestry Association and the Society for the Protection of New Hampshire Forests; Mr. E. C. Hirst, of Concord, N. H., representing the New Hampshire State Forestry Commission and the New Hampshire State Board of Trade; Mr. W. H. Plummer, of Asheville, N. C., representing the Asheville Board of Trade; Mr. J. W. Haynes, of Asheville, N. C., representing Buncombe County; Mr. J. C. Smoot, of North Wilkesboro, N. C., representing the North Carolina Forestry Association; Mr. W. M. Goodman, of Knoxville, Tenn., representing the Knoxville Board of Trade; and others.

... chairman of the committee ... having an appointment at the W... considerable time. ... of the fact that he has a bill ... district and the people ... Rivers and Harbors. The Com... of their hearings in adv... fortunately for Mr. Lee they ... and therefore it was necessa... absence from this meeti... distinguished gentl... presiding at this hearing. ... interested in the Appala... rather, in the extent ... hearing. I understan... hearing this morning. ... have you present the ... glad to give them a ... It was understood th... a half or two hours. ... you, Mr. Chairm... stating the reasons w... purchase of forest lands ... Appalachian ... New England should be con... privilege of presenting ... States and I will ask him t... what is known as the Wee... law was enacted.

STATEMENT OF MR. HENRY S. GRAVES, CHIEF OF THE FO... SERVICE, UNITED STATES DEPARTMENT OF AGRICULT...

Mr. Graves ... bill which has been passed $11,000,000 for the pu... ... navigable streams. It provides ... between the Federal Government a... States through the Secretary of Agriculture, for the pro... ... watersheds of navigable streams whe... lands are to be bought by the Government.

Regarding the latter point, I will say that there has been carr... the last three years ... a small appropriation in bill of the Depa... of Agriculture $... for the examination of that cooperative ... in the estimates which are before your committee now ther... from $... ... this work for the coming fisca... That, I imagine, will be brought up in the hearings on the ... general bill, and we will have an opportunity to present in det... ... will be found to be in the last year and what it is propo... the next year.

I will recall that nearly $... of the $11,000,000 appro... for the purchase of lands at each. The bill was approved on M... 1911. The signing of the bill authorized the expenditure of $... ... before the expiration of the fiscal year 1916. That million ... therefore was left available. The $2,000,000 appropriated f...

ar 1911 lapsed with the exception of such small amount as was pended in the administration of the law.

It took about a year to build up the organization necessary for the eration of the law—to build up the organization of timber exam- rs, surveyors, and title attorneys necessary to carry out the work. e National Forest Reservation Commission requested Congress to ange the law so as to make available until expended the appro- iations for each year, in order that the commission might not be a position of being forced with the hasty expenditure of this oney in order to make use of it.

Mr. WILSON. Can you tell us how much was expended for the inistration or creating of the organization?

Mr. GRAVES. During the first year?

Mr. WILSON. Yes; during the first year.

Mr. GRAVES. I think, during the first year, there was expended bout $17,000.

Mr. WILSON. $17,000?

Mr. GRAVES. That is my recollection. There was in existence in he Department of Agriculture a great deal of information regarding he areas in the White Mountains and the southern Appalachians hich were to be considered for purchase. The first step was to esignate the areas which were important for the purposes of the w, and there have been laid out 21 such areas within which 16 urchases have been authorized by the commission.

The function of the Forest Service under the direction of the Sec- retary of Agriculture has been to select these areas in the first in- tance to examine the lands and appraise their value, to negotiate with the owners of the lnad for the purchase, and to report to the Forest Reservation Commission with recommendations regarding the purchase and reasons therefor, and after the approval of the lands by the Forest Reservation Commission, to make the necessary sur- veys, to establish boundaries, and determine the areas as a basis for the title work which is carried on by the Solicitor's Office in the Department of Agriculture and the Department of Justice, and as a basis for final payment for the lands.

Before lands are recommended to the Forest Reservation Commis- sion for purchase, the Geological Survey, in accordance with the terms of the law, examines them and certifies as to whether their character is such as to meet the purposes of the law. In the selec- tion of a tract for recommendation for purchase, there is considered, in the first place, the strategic value of the tract for the purposes of the law; there is considered, further, the practical question of build- ing up units of administration, so as to secure land in as solid blocks as possible rather than in widely scattered bodies; it is necessary also to get the land at the right price. Of course, there are a good many tracts which are not offered for sale, and it has been the policy of the Forest Reservation Commission not arbitrarily to condemn property, but to make use of condemnation proceedings solely for the purpose of perfecting title.

The achievements during the time this law has been in effect are fully set forth in the report of the National Forest Reservation Com- mission for 1915 with full details as to the amount of land which has been secured up to the end of the fiscal year 1915.

Mr. [illegible]. Can you tell us how much has been acquired up to the [illegible] of fiscal year 1915?

Mr. [illegible]. At the end of June 30, 1915, there had been acquired [illegible] acres.

Mr. [illegible]. How much did that cost?

Mr. [illegible]. It cost an average of $5.22 an acre.

Mr. [illegible]. The total amount was how much?

Mr. [illegible]. And the total amount was $6,585,[illegible].

Mr. [illegible]. How many of the fund available now?

Mr. [illegible]. There is now available a little over $1,[illegible] more than the amount needed for administrative expenses during the [illegible] fiscal year. That is, there would be available during the [illegible] fiscal year a little over $200,000 which could be [illegible] for the purchase of land.

Mr. [illegible]. Exclusive of the administrative features of it?

Mr. [illegible]. Yes, sir.

Mr. [illegible]. And how much of this fund has lapsed which was not available for expenditure?

Mr. [illegible]. Nearly $8,000,000, sir.

Mr. [illegible]. The total amount appropriated was how much?

Mr. [illegible]. $11,000,000.

Mr. [illegible]. Are there any questions?

Mr. [illegible]. As I understand, $11,000,000, was the total amount appropriated?

Mr. [illegible]. Yes, sir.

Mr. [illegible]. And about $8,000,000 lapsed?

Mr. [illegible]. Yes, sir.

Mr. [illegible]. And something over $6,000,000 were spent for the purchase of land?

Mr. [illegible]. Nearly $6,000,000 was spent up to the 1st of July of last year, and there has been authorized by the commission the purchase of certain other lands which sets up a liability of about $500,000.

Mr. [illegible]. And then the balance necessarily represents what was spent [illegible] administrative purposes?

Mr. [illegible]. There is about $200,000 left available for the purchase of land, and to the balance we have allotted for the continuance of the administrative work during the balance of the current fiscal year.

Mr. [illegible]. What would be the cost of the administrative work?

Mr. [illegible]. Mr. Hall, can you remember what that balance would be?

Mr. Hall. I think the estimate for the year is about $175,000.

Mr. [illegible]. That would be $200,000 then, that is left available for the purchase of land, and $175,000 for administrative purposes, that is, [illegible] as I understand.

Mr. [illegible]. What has been the annual cost of the administrative [illegible] for the last few years?

Mr. [illegible]. Can you answer that, Mr. Hall, that particular figure?

Mr. [illegible]. The total cost of all the examinations, including the administrative [illegible] and the work done under this act, to the end of last [illegible] was $[illegible]. I have not the figures here

ırs, although they occur in the annual reports of the commis-

McLAUGHLIN. Does that include all the expenses of adminis-
ı, and the balance will be the amount of money available for
ısing lands?
HALL. It includes all the expenses that were charged against
ınd. For several years it was not possible to use any of this
or the payment of clerk hire or draftsmen or such expenses
city of Washington. For the last year that has been possible.
rior to that these expenses were defrayed by the Forest Service
y the Solicitor's office, or wherever that work was done. It
ot include the work which has been done in the Department of
e and the offices of the United States attorneys in the various
ts where the lands have been acquired.
LESHER. About what will it cost to take care of this land
ou have purchased it?
HALL. At the present time it is costing about 5 cents an acre
ar. The expense for protection and administration is con-
y coming down. It has come down about a cent a year for
st three years, due to our improved organization and our
ing larger bodies of land to handle. When we have large solid
of land to deal with, the expense will be brought much lower
ı present.
HOWELL. How many acres of land does your plan contem-
urchasing if you are given the money which you want?
HALL. In the report made to Congress in 1907 by the Secre-
f Agriculture, he estimated that 5,000,000 acres would be
ary, in the long run, in the southern Appalachians, and about
00 acres in the White Mountains. The present commission
en virtually working on that basis.
HOWELL. What is the approximate cost of your 6,000,000

HALL. We can only judge by the cost of the land to date, is $5.22 an acre for 1,317,000 acres.
McLAUGHLIN. I do not believe I quite understand the figures ıave given. $11,000,000 were originally available, and ,000 lapsed, leaving $8,000,000 of the appropriation available. ost of the land has been something more than $6,000,000, nearly $2,000,000.
RUBEY. Nearly $7,000,000 has been spent for the purchase ls?
McLAUGHLIN. Nearly seven. Well, leaving more than a ı dollars.
HALL. Perhaps you have not counted in the expense of the ıation and surveys.
McLAUGHLIN. I should like to know the entire amount that has evoted to other purposes than the purchase of lands.
HALL. It is the figure which I stated, $743,000.
RUBEY. Mr. Chairman, I would suggest that that whole matter be gotten at in this way: Let an itemized statement be pre- and put in the record showing what has been done with this . Can not that be done?
HALL. Yes, sir.

[illegible]

STATEMENT OF MR. GEORGE [illegible] SMITH, DIRECTOR O
STATES GEOLOGICAL SURVEY DEPARTMENT OF
INTERIOR.

t. On that account field investigations of areas proposed for con-
ration under this act were immediately begun by the Geological
vey, both in the southern Appalachians and in the White Moun-
as. The work has continued, although the greater part of it was
pleted, in a way, in the earlier years. But by reason of the fact
t our examinations were not made of the small tracts, so much as
y were made of the larger areas, in the region in which these
cts were located, we were rather pushed by the department at the
inning; but we accumulated information and each report or each
mination made could in a way be based upon the previous exami-
tion of similar areas in the same part of the country.

Mr. ANDERSON. Has the expense of the preliminary examination
the Geological Survey been paid out of the appropriation in ques-
n, or has it been paid out of the general appropriations for the
rvey?

Mr. SMITH. It has been paid out of this appropriation so far as
re was work actually done in the field by members of the Geo-
ical Survey staff who were not on statutory salaries. That mat-
, of course, was taken up at the very outset with the Comptroller
the Treasury and a working basis established. In other words,
at extra work was done was paid out of this appropriation.

Mr. WILSON. Mr. Smith, who appraised the values of those prop-
ies?

Mr. SMITH. The Geological Survey had nothing to do with that.
r point was simply the question of the relation of the control of
se lands to the improvement and the protection of the naviga-
ity of the streams below them.

Mr. WILSON. Do you know who appraised the lands? Are you
miliar with that?

Mr. GRAVES. The Forest Service is responsible for the appraise-
nt.

Mr. CANDLER. Then the only expense outside of this fund that was
ne by the Geological Survey was the salaries of those who were
gaged in the work that were on the statutory roll. That came out
your funds?

Mr. SMITH. Yes. I put in several weeks at the start myself, and
course that was not an expense laid upon this particular appro-
ation.

Mr. CANDLER. But the expenses of all other employees from your
vey were paid out of this fund?

Mr. SMITH. I think there was only one case where there was a
logist holding a statutory position who did some work. And, of
rse, as Mr. Hall, I believe, has mentioned, the expenses incurred
e in Washington were not chargeable to the appropriation during
first years and there was some clerical and drafting work done
e in Washington that was paid for. But it was not a large amount
l when you consider the magnitude of the whole work, it is negli-
le.

The problem of determining this relation of the forest to the stream
v was a somewhat different one in the southern Appalachians
m what it was in the White Mountains; but I believe in almost
ry case where an area was examined, the report of the Geological
vey was favorable to its acquisition. And while in one way

... what ... as follows: ... mission ... I be- ... and an- ... was in eastern ... not so ... general ... to the ... of the ... necessarily ... sifting up ... excessive ...

Mr. ... What has been the effect since these lands have been ... ? Have floods been overcome?

Mr. ... a gradual process like the silting up of a stream-bed, ... but it is true ... in the mountain area we have a case where a ... of the ... has silted up by reason of unusual conditions in the ... of the ... mines. There there was deforestation of a ... character and the consequent heavy erosion and large ... additions to the stream of soil of all kinds. But ordinarily that is not something to be measured by the term of a few years, but by a generation or by centuries. But because it is slow it is none the less certain. It is really a case of the wills of the gods.

Mr. ... The commission has purchased 300,000 acres; is that right?

Mr. ... Yes.

Mr. ... The appropriation does not bear to the whole amount that ought ... be purchased if more or more out your idea of preventing erosion ... and ... the navigability of streams, etc.?

Mr. ... I believe ... used the term "strategic ... I ... I believe that although the purchase of these lands ... will ... influencing other lands for the control ... I believe it comes down to the question of ... the best use ... of certain areas in the southern Appa... ... so far as they are available ... I believe ... has been the policy of the commission ... except ... a few cases the use of such lands ... the greatest kind of danger to the ... and to the whole ... Their use, then, for agricul... ... only be temporary. And it is the highest use. ... and I think you will agree that there are ... areas where the highest use of the land must be the growing of ...

Mr. ... What use was this land put before it was purchased?

Mr. ... Many ... parts of it ... of the areas that I have been ... lumbered and sometimes too heavily deforested. I ... been used as forest areas and sometimes too heavily

cut. In other cases they have been used for what you might call temporary farms in some parts of the South where, as many of the members know, in the high mountain country it is quite the custom to have a deadening, I believe it is called, Mr. Chairman, and the field will be cultivated for a few years, and its fertility practically exhausted and then it goes back to the state of nature. The unfortunate thing about that is that while it is in that condition the soil starts on its course down to the stream. The few years that it was unprotected by tree and brush cover was sufficient for the surface to be removed and get well started on its downward course. And the work of centuries in making soil was in a few years destroyed by the soil being washed away.

Mr. HELGESEN. Mr. Chairman, I would like some one to make a short, concise statement of the object of these purchases, the benefit to be derived, both as to navigation and otherwise, and their importance from the standpoint of shipping on those navigable streams.

Mr. SMITH. Mr. Chairman, I can give one illustration, possibly. Take one of those first areas that were examined in Georgia and in Tennessee. I think that the records of stream flow which we had made in our regular geological survey work, before this investigation started, and special measurements that were made at the time indicated that during the period of low water the contribution of water into the Tennessee was almost wholly from these highest parts of the watershed, from these mountainous regions. If the capacity of these mountainous tracts to hold water from the time of the greatest precipitation and to let it out gradually during the time of no precipitation, the summer months for instance, if it were not for that retarding influence in the higher parts of the State there would be very little water in such rivers as the Tennessee at its low-water stage.

Mr. HELGESEN. There is at the present time, then, very little water in the Tennessee at that time of the year?

Mr. SMITH. I would say that there would be practically none, because we were able by a comparison of the stream records to know just how much came in from each part of the drainage basin. Of course, that is in connection with the regular stream-gauging work of the Geological Survey.

Mr. HELGESEN. At the present time, no benefit has been derived from this work, because it is in its infancy?

Mr. SMITH. Yes.

Mr. HELGESEN. And it is true, then, that the rivers can not be used for navigation at such times of the year for which you went to make them navigable?

Mr. SMITH. Of course, you are touching now upon another phase of the improvement of navigation, which is under the War Department, of securing as much slack-water navigation during that stage as is possible.

Mr. HELGESEN. What I am trying to get at is this: In the first place, what improvement can be made in those streams by the purchase of these enormous tracts of land, and secondly are the streams sufficiently important as navigable streams to justify the expenditures?

Mr. SMITH. Now, you are touching upon the large matter of policy. I can answer the question more directly by saying that if headwaters are not protected in some way, if their capacity for storing the water

[illegible] should be reserved, why there were any [illegible] the water to use for navigation purposes [illegible] instead of that.

[illegible] furnished us with the tonnage of [illegible] of the importance of the [illegible]

[illegible] available in the report of the Army [illegible] rivers and harbors investigations.

[illegible] streams affected by the pur- [illegible] data for these streams are to be [illegible]

[illegible] purchase of the land which [illegible] valuable water-power sites [illegible] members of the commission [illegible]

[illegible] water-power sites usually cost so much that [illegible] purchase them in connection with the [illegible]

[illegible] purchase and reaching down to the bed [illegible]

[illegible] do in the case of the smaller streams we do, but [illegible] streams the owners usually put a value on [illegible] to the government to acquire them.

[illegible] know if in the purchases [illegible] water sites.

[illegible] have included many very valuable [illegible] sites, and a good [illegible] power value. The [illegible] farther down the [illegible]

[illegible] which would form a stra- [illegible] power?

[illegible] whose transmission lines will [illegible] in a number of in- [illegible]

[illegible] to charge rental for [illegible] transmission of hydroelectric power [illegible]

[illegible] they are on the [illegible]

[illegible] develop the water [illegible]

[illegible] the prevention of destruc- [illegible] the control of the soil and in regulating [illegible] to all [illegible] water power and municipal [illegible]

[illegible]

[illegible]

Mr. [illegible]. [illegible] sites which we are [illegible] owners are unwilling to sell [illegible] and so are allowed

ie Government ownership in an educational way. The educa-l effect of these purchases is already very large. We are going able to cooperate with private owners in fire protection, so that alue of the Government ownership is going to extend beyond the daries of these lands themselves.

. HELGESEN. What other benefit is there from these purchases ot to navigation?

. GRAVES. That is the principal purpose of the law, but the right ing of these forest lands has other public benefits which are very ; one such benefit is the increased production of these lands.

. HELGESEN Of the lands that you are purchasing?

. GRAVES. Yes; instead of having them constantly deteriorating inally become practically waste, they will constantly be made productive.

. MCLAUGHLIN. Is not that the real purpose in the purchase of lands? Is it not true that it has been determined that the ral Government had no right to acquire land for those purposes you speak of, and that this whole thing hinged on the power luty of the Federal Government to protect navigable streams?

. GRAVES. I do not think that any of the great benefits of these ases should be overlooked. A very large background of this enterprise is the general public benefits. But the protection e navigable streams is in itself a sufficient justification for the ases.

. MCLAUGHLIN. You know when this mov ment started that a nd was made on the Government to purchase these lands for urpose of saving the timber from destruction and protecting the er. That was the idea in back of this movement in the first . But the Committee on the Judiciary of the House made an tigation and reported that the Federal Government had no rity to expend money for that purpose, but it had a right to id money to preserve navigable streams. And upon that opin-his whole proposition has hinged. Now you speak of these other ses that are to be served. I do not know whether you are able ve us any estimate of the relative importance of these different and purposes.

. GRAVES. I think that all public benefits from having the forests handled in these mountain areas should be taken into consider-, not only the maintenance of the navigable rivers but the tenance of these lands in a productive condition, in contrast to nproductive condition of the lands which have been allowed to rned over and finally to be made practically a waste, of which ave many examples in this country. I think the benefit to the ties themselves of having productive areas in these regions as a for their industries is an important one. The maintenance of treams in condition for the maximum development of power and ater supply of towns and cities are also benefits of great present reater future importance.

. HELGESEN. I understand that some of the European Govern-s, under the general welfare departments of their governments, ow preventing private owners from cutting except according to rders and directions of the Government. Do you think that l not be done in this country?

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...r for all time, is to have the timber on the lands that

Mr. ... Only the merchantable timber only is reserved, and
...during a brief term of years. I believe in one case it

Mr. ... In cases where timber is reserved by the owner the
...extends only for a few years and the timber must be
...rules and regulations of the Secretary of Agriculture,
...ects the young trees and safeguards the tract from fire.

In several instances we have found tracts which were subject to timber contracts for a short time and the lands are bought subject to those contracts. But as soon as the contracts expire the lands are owned in fee and without incumbrance by the Government.

Mr. HAUGEN. In what respect are the forests protected; the cutting of the timber then comes under the act and rules governing national forests?

Mr. GRAVES. After the acquirement of the land they will be just the same.

Mr. HAUGEN. Just the same as the national forests?

Mr. GRAVES. Yes, they will become national forests.

Mr. HAUGEN. There is nothing accomplished, then, by the purchasing of the lands if you would obtain the same result by placing these lands in a forest reserve?

Mr. HELGESEN. But these are private lands.

Mr. HAUGEN. Oh, but he said it has extended beyond private lands.

If the lands were in a forest reserve and the timber cut under the regulations of your bureau, the same result could be secured as if it were possible to place them in the forest reserve?

Mr. GRAVES. This act does not establish control over private lands. It is only on lands that are acquired that we have any jurisdiction. These acquired lands will be made into national forests and the administration will be along the same line as in the present national forests. The timber will be sold and we are already on some of the tracts to which title has been obtained making sales of timber.

Mr. HELGESEN. But they could not be placed under the forest reserve at all without they were purchased?

Mr. GRAVES. They have to be purchased because at the present time they are privately owned.

Mr. MCLAUGHLIN. Under the Forest Service, under the law relating to it, you were directed to make a survey of lands within the national forests to determine areas suitable for agriculture and they can be released from the forest reservations. Is there any authority under this law by which land more suitable for agriculture (lands which, perhaps, had to be bought in order to secure those which you must have) can be released?

Mr. GRAVES. Yes, sir; such lands can be sold at their appraised value.

Mr. MCLAUGHLIN. I believe these lands purchased under the Weeks Law have the same privilege, or, rather, the States in which they are located, have the privilege of receiving 35 per cent of the receipts, the same as the States in the West where the large forest reservations are located.

Mr. GRAVES. Yes, sir.

Mr. MCLAUGHLIN. Have there been any revenues from these lands?

Mr. GRAVES. There have been a few small sales, and some revenues from other purposes—could you give that figure, Mr. Hall?

Mr. HALL. I have not the exact figure, but altogether only a few thousand dollars; I think about $7,000.

Mr. MCLAUGHLIN. The law says if you find land more suitable for agriculture, you may sell it; the State does not get 35 per cent of

that does it? Is not that covered into the Treasury for the benefit of the funds?

Mr. GRAVES. I could not answer that. I am not familiar with the legislation to that effect, I would say. There is a little amount of money, however, but the amount would not be large. Is that right, Mr. McGoodwin?

Mr. MCGOODWIN. The fund would be covered into the Treasury, and would not go to the States. It would go into the Treasury for any purpose, from the benefit of which the States would receive no benefit. Mr. Hill had stated to the committee that the land was not to the sale of the land.

Mr. MCLAUGHLIN. There is a certain amount of revenue that comes from these lands, and of which the State would get a certain part.

Mr. GRAVES. A few thousand dollars. Mr. Hill is right about it. The land has been only recently acquired, and there has not been time to receive much revenue.

Mr. MCLAUGHLIN. I gather from what Mr. Smith said, and from what you said before that some of the land is being sought for strategic purposes to be used in connection with other land under your control. Am I right about that?

Mr. GRAVES. Not because there would be any benefit in running under the control of the Government, but because—

Mr. MCLAUGHLIN. I thought not.

Mr. GRAVES. The point I tried to make was that in many cases there are private tracts interlocking with the Government tracts in sections which we are purchasing, which it is not possible for the Government to secure, but which through cooperation we could help to have protected from fire and help better the conditions.

May I give an instance of the city watershed of Asheville. It includes 17,000 acres, and is owned by the city. It is in part surrounded by the Government land. We are cooperating with the city and with certain private owners in a fire-protection system covering the whole area.

Mr. HAUGEN. Speaking of the 17,000-acre tract, was that purchased from one owner?

Mr. GRAVES. This tract belongs to the city of Asheville, it was acquired from several different owners, and it is being held by the city to protect the city water supply, which is derived from this tract. It is partly surrounded by lands which were bought by the Government.

Mr. HELGESEN. Now, Mr. Chairman, if this committee and Congress is to base its action with respect to this matter on the right of the Government to protect its navigable streams, I wish we could have inserted in the record the annual tonnage of the streams that are to be benefited.

Mr. CANDLER. If that can be furnished, without objection it will go into the record.

The point involved in this hearing, as I understand, is this: This question as to the establishment of these forest reserves has already been passed on by Congress and indorsed in this act, and the question presented this morning, as I understand it, is whether or not more money should be appropriated for the purpose of buying additional lands. And that is the sole question involved in this hearing. So far as this policy is concerned and so far as the establishment of the

palachian Forest Reserve is concerned, that has already been done, d the money has been expended and this land has been purchased, d there is only about $300,000 left, as I understand, with $175,000 r administrative purposes. And the question presented this morn- g is whether or not this money shall be provided for the purchase additional lands. That being the point involved, I would suggest at the hearing proceed along that line, and that you give all the cts in reference to that that it is possible for you to do.

Gov. CRAIG. Mr. Chairman, I now present to the committee the ntleman who represents the State of New Hampshire, the Society r the Protection of the Forests of New Hampshire, and the Connec- cut Valley Waterways Association—Mr. Allen Hollis.

STATEMENT OF MR. ALLEN HOLLIS, OF CONCORD, N. H.

Mr. HOLLIS. Mr. Chairman and gentlemen of the committee, my me is Allen Hollis; I come from Concord, N. H. As has been ted, I have come at the request of the governor of New Hampshire represent that State in this hearing.

My connection with forestry associations has already been accu- tely stated.

I will say at the outset that I have been requested by many people re to make a general statement on behalf of the entire meeting, as ay say. And my remarks will not be confined to the interests of w Hampshire.

I will, however, point out in passing, that there has been some apprehension as to the relation of the States in which these lands taken, to this question. It has been thought by superficial nkers that these States are selfishly interested to have these land rchases made by the Federal Government. Speaking solely for w Hampshire, because I am not aware f the conditions in the ier States, I want to point out to the committee that there is solutely no foundation for that be f. But let me show you why w Hampshire happens to be th ion for the White Mountain ion. And I say appens" it we can say about it. The White ntains a re large navigable eams, stream are a luable, for water- wer purpos Those st nd f New Hampshire, that m im they are born. We ve th r an ng into Maine—now, vil ew generally go to Maine th iver running into Mas- tts with iderable I have home. to Con- see this nevitably ned, of the rest lands have New Hampshire e lands were years

[illegible] foreigners," without any [illegible]. Of the purchases that have [illegible] to the present time, I believe nine- [illegible] people who are not residents of New [illegible] corporations and individuals living in [illegible] elsewhere. So that you see there is [illegible] New Hampshire propaganda, so far as the [illegible]

[illegible] foreigners," you do not mean [illegible]

[illegible] aliens. You know, in New Eng- [illegible] who was not born in our State. We [illegible]

[illegible] shortsighted view, it is an absolute [illegible] what I say—it is an absolute detriment [illegible] to the citizens of New Hampshire to have these [illegible] by the general government because it immediately [illegible] property in the State, and there is [illegible] property in the State. Every acre [illegible] White Mountain region is, under our laws, [illegible] towns in which it is located, and as soon [illegible] the tax warrant we lose the annual [illegible] Now as I say, that is a short-[illegible]

[illegible] much is the tax on this character of [illegible]

[illegible] its value. Let me give you that con- [illegible] a thousand acres owned by a paper [illegible] lands have been owned by paper com- [illegible] State puts out examiners to [illegible] this land, but you know that [illegible] market value, but they do very [illegible] they get up to three-quarters at least [illegible]

[illegible] taxed on the same basis as any other agri- [illegible]

[illegible] same

[illegible] What I was trying to get at is the assessed value [illegible]

[illegible] rule applied to that, as a rule, is only 2 per cent; [illegible] land is valued at $100,000, the tax on it is $2,000 [illegible]

[illegible] What I am trying to get at is what has been the [illegible] those lands prior to purchase by the Government?

[illegible] compared with what it was before?

[illegible] valuation per acre.

[illegible] Whatever was on them, a dollar or two dollars, [illegible] how much timber was on them. And you see, here [illegible] must be borne very carefully in mind by the com- [illegible] difference in the value of those lands which [illegible] boys, whether they have been cut and burned over, [illegible] as in the case of many areas, they were covered with [illegible] forests worth $5 a thousand feet standing on the land. [illegible] how difficult it is!

Mr. ANDERSON. There does not appear to have been any such ergence of value of the land which has been purchased.

Mr. HOLLIS. And that is for the reason that they buy a large a—because I am familiar with New Hampshire conditions (it is mall State and if a man keeps his eyes open, he knows all that is ng on in the State); they buy an area, we will say, of 10,000 es. Now, there will be some areas in that acreage that is worth cents an acre, there will be some areas that are worth $50 an acre. e way they do, and it is the only way to make an intelligent luation, is to say how much the land is worth without any timber it. Normally, it would be two or three dollars an acre. Then y estimate and value the timber that is growing on the land. ey ascertain how many thousand feet of spruce and other timbers re are per acre and how many acres there are. When they get ough they know the size and value of the tract and the quantity l value of the timber.

Now, I was very much pleased to hear it stated to-day that the te is going to get back some percentage of the income from these ds. It is a problem with us to-day, it is a real problem where the ds are located in organized towns to make up in taxes for the hdrawal of these lands from the tax lists. And our opinion in w Hampshire is simply this: We know—and I am gong to state s pretty strong—that the jurisdiction over those areas in the White untains is essential to the continuance of those streams, whether navigable purposes which has been referred to here as if it were onstitutional pretext, or for the preservation of water powers, or other manufacturing uses.

It has got to be done, and we simply have asked the Federal Gov- ment, in effect, to make a good investment, because I want you ntlemen to understand that every dollar that the Federal Gov- ment puts into this land it is going to get back ultimately from growth of the timber on the land. And all the great public nefits that we are urging here to-day we are going to get extra, as y-product, without costing a cent. Now, I want that very clearly derstood, because the secret of this whole proposition is that you buying your lands well; you are getting your lands cheap; they a good investment for anybody to take at the price. And the overnment will realize, as I said before, ultimately, every dollar ey put into them, with interest at a fair rate on the money invested; d all the other benefits they will get for nothing.

Mr. LESHER. Have you had sale for those lands to anybody else cept the Government?

Mr. HOLLIS. They are being sold every day, over and over again there. And the Government gets them at the market price. ey buy intelligently. And they have succeeded, I know, in my ate in convincing the owners who thought that their land was orth $10 an acre that it was only worth $5, by estimating the value the timber.

Mr. CANDLER. They have paid an average of $7.15 an acre?

Mr. HOLLIS. Yes.

Mr. HAUGEN. What were these lands sold for before the Gov- nment engaged in the business of purchasing the lands?

Mr. HOLLIS. Beginning 40 years ago, those lands were worth about cents an acre, and they have been going up ever since. I was

[illegible] before this same committee [illegible] of the Members here now were [illegible] but at that time that the Government [illegible] the lands went up very higher, because the [illegible] with the advancing price of timber, and it [illegible] in price. So that they have [illegible] New Hampshire in 40 years from it came [illegible] are worth to-day, which is a question of [illegible]

Mr. [illegible] a fact that when the Government did go [illegible] already advanced more than they [illegible] of the land that was believed to be the object of the [illegible] price of the lands?

Mr. [illegible] speak for New Hampshire. I think the [illegible] has been rather to bring the owners to a [illegible] lands were worth a less value than they had [illegible]

Mr. [illegible] give us the selling price five years ago and [illegible]

Mr. [illegible] than you can give the selling price of a [illegible] the house as compared with some other [illegible] advanced in price in five years, and so [illegible] in the five years preceding that. Because [illegible] the timber market in the last two or [illegible] has not been much movement of timber-[illegible]

Mr. [illegible] generally considered that the Government [illegible] under this act, for the reason that we [illegible] an ordinary commercial firm will take and [illegible] will make a more severe examination and the purchase [illegible] two in order to complete the title before [illegible]

Mr. [illegible] expressed the opinion that if they could devise some means of getting quicker action so that the men would know definitely how soon they could get their money, they could buy somewhat cheaper. I believe that is the fact.

Mr. [illegible] You state the most of those lands are owned by foreigners, that is people who do not live within your State. Can you tell what incentive there was for the purchase and acquirement of these lands by foreigners?

Mr. [illegible] a matter of timber supply for the paper mills.

Mr. [illegible] In one case in New Hampshire, if I remember right, a certain price was asked and the commission had the proposed sale under consideration, I think, for two years.

Mr. [illegible]

Mr. [illegible] And the price we finally paid for it was many thousand dollars less, I think, about 60 per cent of the original price asked. Mr. [illegible] will be able to answer definitely on that, but it was a very large reduced price.

Mr. [illegible] The price finally paid was only about 40 per cent of the original price asked.

Mr. [illegible] Yes, sir; I am familiar with that case myself.

r. HAWLEY. And the fact that we do not buy immediately but carefully has, in almost every instance, resulted in a saving to Government over the sale of surrounding timber?

r. HOLLIS. I am taking up too much time, but you will pardon I hope, because you are asking questions that I would like to wer. There are two sides to that question. It is true the delay le necessary to give the Government a perfect title, involving necessity of condemnation proceedings, stands in their way for king the sharpest trade. Any Yankee knows, and I suppose that people who do not live in New England know as well as the Yankee ws, that you can buy stuff with cash cheaper than with any other m of currency. I believe that has a little influence against the rernment's being able to buy at the very lowest price. But, on other hand, what has just been referred to now, about a reduction rice due to waiting, is what I meant when I said the Government cials had convinced the owners by actual demonstration that their ls were not worth as much as the owners originally thought they e. It is the general opinion up in our country that the Governit representatives are the hardest people to trade with that we e had any experience with.

r. HAUGEN. Are we to understand, then, that the Government uld accept a defective title?

r. HAWLEY. We will not accept any defective title.

r. HOLLIS. No, sir; they condemn the lands and clean out everyy; that is the way they get a good title.

r. HAUGEN. My understanding is that the time consumed is for purpose of perfecting the title.

r. LESHER. Is your own State of New Hampshire buying any of e lands?

r. HOLLIS. I am glad to have that question asked, because it was next number on my program.

r. LESHER. The reason why I asked is because in my own State, nsylvania, we are doing that ourselves.

r. HOLLIS. Of course, New Hampshire is not a wealthy State. fact that its property is owned by nonresidents is some proof hat. The State has bought the Crawford Notch, a very important ic point of the White Mountains. The tract contains about 0 acres and cost the State approximately $100,000. The State also made an appropriation of $5,000 a year for buying waste ds and reforesting them, and it is appropriating, I think, about ,000 a year for maintaining a forest department for fire protection poses and the like. So we feel that we are doing our share. I will , as a citizen of New Hampshire, that I want the State to do more, I think it will; but this White Mountain proposition is a matter the Federal Government to deal with, because it is too large for and it involves much for the whole of New England and, in fact, whole of the United States.

Now, I have been asked to present to this committee the exact m of the amendment which we desire to have made to the Agriture appropriation bill. This may have been laid before the comtee. It expresses in legal language the idea of continuing the sent appropriation of $2,000,000 a year for the next five years,

(The memorial referred to will be found at the conclusion of Mr. Hollis's remarks.)

Mr. HOLLIS. I wish to call attention to the fact that there was a very profound sentiment in this country in 1911, which resulted in the passage of the Weeks bill. It seems to me that that was the very strongest sentiment that was ever expressed to Congress in modern times divorced entirely from any political significance. And I would like to have you gentlemen bear in mind that there has never been the slightest politics in this movement, but the whole sentiment has been that of the welfare of the country. And it has been to my mind a remarkable example of a movement disinterested in itself and entirely separate from political significance. And I would like to call the attention of the committee to the fact that at a hearing as far back as 1906, before the Committee on Agriculture, there was a petition presented here on the water-power side. As a constitutional lawyer I do not know whether the Federal Government has any right to do things in the White Mountains—for instance, to improve water powers on interstate streams—but I believe it would take a decision of the United States Supreme Court to decide me that the Federal Government had not the authority to look after interstate streams.

Mr. HAWLEY. Had or had not?

Mr. HOLLIS. I say it would have to be decided by the Supreme Court before I would believe that the Government has not the power to do that. In other words, I believe it has, and I shall always believe it has until I am compelled by superior force to change my mind.

At that time the water-power users were represented at the hearing by a petition signed by over 100 of the manufacturing interests of the five States I have named, and was attended by the water-power interests on these streams representing a capital amounting to $130,000,000. That is one of the influences. Now, you might say that is an interested influence. That is true; they were interested to have their water powers preserved; but it is the kind of interest that the country needs and the kind of interest that gives employment to people and makes prosperity for large sections of the country. Just note the figures—over 100 manufacturing associations, representing a capitalization of over $130,000,000.

The next thing I want to call to the attention of the committee in that line, as showing public sentiment, is a list of the organizations actively supporting the Weeks law from 1906 to 1911, when the bill was passed, and which sentiment, in my opinion, resulted in the passage of that law. It is printed on this sheet that I hold in my hand, and, for the benefit of the committee, I would like to ask to have that printed in the record. I regard that as the most significant list of organizations supporting a movement of this kind that could possibly be produced to any committee.

Mr. CANDLER. Without objection, that matter will be printed in the record as requested.

(The list referred to will be found at the conclusion of Mr. Hollis's remarks.)

Mr. HOLLIS. The list contains the names of such associations as the American Cotton Association, the American Institute of Electrical Engineers, the American Society of Civil Engineers, boards of trade

[illegible]

Mr. WILSON. What names are those?

Mr. HOUSTON. The names of the various organizations which have recently passed resolutions or expressed opinions as to the advisability of continuing these appropriations.

Mr. CANNON. Without objection they will be incorporated in the record.

The papers referred to will be found at the conclusion of Mr. Houston's remarks.

Mr. HOUSTON. I will read the names of only a few. The Association of Eastern Foresters, which cover the foresters of the State department from the New England States to New York, Pennsylvania, and Maryland; a resolution adopted by the board of directors of the San Francisco Chamber of Commerce——

Mr. WILSON. I judge, if you are going to put that in the record, there is no necessity of reading that here.

Mr. HOUSTON. May I call attention to just a few of them, for their geographic significance only? I want to show that I am speaking for a larger section of the United States.

Mr. WILSON. Are you a Member of Congress?

Mr. HOUSTON. No; I am not.

Mr. CANNON. It is a matter of the economy of time; there is only about 30 minutes left.

Mr. HOUSTON. In view of that, I will simply put the bunch in the record, and you will find out what they are. I would like to call attention to a letter which I understand Mr. Myrick, editor of a series of agricultural publications, has written to the committee. His publications reach several million subscribers, and that is the

nd of sentiment that is existing, and which can be made to express elf in this manner.

My final word is to call attention of the committee to the best gument there is on the subject. It is in the report of the National orest Reservation Commission, of which two of the distinguished embers of this committee are members. I do not think it is necesry for me to do more than to call attention to it, but I will ask, if I ay, to have these paragraphs which I have marked on this report rinted in the record, because it is the whole story in a nutshell. I fer, on pages 21 and 22, to the section headed "Further appropriions needed," and I will ask to have this printed in the record.

Mr. CANDLER. It will be included.

(The quotation referred to is from the Report of the National orest Reservation Commission for 1915, H. Doc. No. 130, and is as llows:)

The wisdom of the Government's acquiring and administering extensive bodies of rest land at the headwaters of the great navigable rivers has become entirely clear. ar-reaching good will result in safeguarding the streams from erratic flow and in proecting the watersheds from destructive erosion to which they are subject when rwisely cleared. A basis will be afforded for permanent industries in regions which herwise are in danger of ceasing to be productive and of becoming a menace to the vigable rivers and to the communities situated upon them.

The appropriations which were made have been sufficient to start the work and ake very substantial progress. Through the care exercised in making purchases e lands acquired are so well situated for administration and use that even should ppropriations cease considerable good would be accomplished. But the program ould not stop at this point. It should go further. However, the commission does ot look upon the program as requiring expenditures through a long period of time, ut rather through only a limited number of years.

Renewing its recommendation of the last year, it is the judgment of this commission hat the work can best be done under appropriations covering periods of five years ach, the appropriations becoming available annually and remaining available until xpended, as is now the case. Experience has shown that it is impracticable to ttempt to do this work under appropriations which expire with the fiscal year. It s also of the utmost importance that appropriations be continued through periods of ot less than five years. When the work was begun a force of timber cruisers, title xaminers, and surveyors had to be assembled and trained, a task which required two ears. It would be most unbusinesslike to have to disband this force on account of gap in the appropriations. If purchases were suspended, it would also require much ime and expense to build up a new force and get under way again, the negotiations hat would have to be broken off. Many of the cruises and examinations which have een made and which had not resulted in purchases would have to be made over gain and the intimate touch with the land situation which is now enabling purchases o go forward smoothly would be lost. From every point of view it is highly desirable hat appropriations continue without a break.

It is again emphasized that the Congress establish this project upon the basis of an ppropriation of $11,000,000. One million dollars appropriated for the year 1910 never ecame available at all. Instead of hastening into purchases in order to utilize the ppropriation for the year 1911, which would have been unbusinesslike and would ave resulted in loss to the Government, the commission adopted the conservative olicy of making purchases only after full information had been secured in regard to ach tract and reasonable prices had been obtained. By so doing it established the ork upon a sound basis, but nearly all the $2,000,000 appropriated for the year 1911 everted to the Treasury. These appropriations which were not utilized ought to be eappropriated.

In the judgment of the members of the commission the work should be carried orward in a steady, systematic way. Since the existing appropriations ceased with he fiscal year 1915, it is recommended that action be taken by the Congress during he present session to continue the appropriations at the rate of $2,000,000 per year rom the fiscal year 1917 to the fiscal year 1921, inclusive, and that it make all the ppropriations available until expended.

The papers offered for the record by Mr. Hollis are as follows:

MEMORIAL.

SEPTEMBER 20, 1915.

Hon. DAVID F. HOUSTON,
Secretary of Agriculture, Washington, D. C.

SIR: The movement for an Appalachian National Forest Reserve originated in the South on account of the damage done to the mountain slopes by unwise timber cutting and fires and by forest fires. Congress was memorialized in the matter in 1901 and several bills have been introduced. For a summary of the bills and reports between 1901-1907 see S. Rept. 159, 60th Cong., 1st sess. The White Mountain project was taken up in 1901, and the two movements combined in 1906. Twice bills passed the Senate only to fail of consideration in the House. In 1907 an appropriation of $100,000 was made for an investigation and report by the Secretary of Agriculture. The Secretary's report, published in December, 1907 (S. Doc. 91, 1st sess., 60th Cong.), recommended the purchase of large areas of land in the Southern Appalachians and in the White Mountains. Finally, in 1911 (see circular on the purchase of land under the Weeks law), the necessary legislation was secured and an appropriation of $11,000,000 was made for the purchase of land, of which only approximately $8,000,000 actually became available.

This legislation was secured only after the most earnest efforts of the American Forestry Association and of other organizations represented at this conference. Many hearings were held by congressional committees which were attended by large numbers of representative citizens from the North and the South. The published reports of the hearings and reports of congressional committees show how broadly and thoroughly the question was considered. Many phases of the problem were discussed in publications by the Forest Service and Geological Survey. Action was taken by Congress only after all the bearings of the proposed legislation had been fully considered, and with the full knowledge that if the plan succeeded further appropriations would have to be made to carry the work to completion.

It is now reported by the United States Forester that of the $8,000,000 that actually became available under the Weeks law all except $500,000 has been spent. There has been acquired or approved for purchase 1,285,000 acres at an average price of $6.25 per acre. Including cost of appraisals, surveys, and title-investigation work, the cost has been $5.83 per acre. Purchases have been limited at first, as we believe wisely, to the southern Appalachian and the White Mountain regions. Considering only these regions, the program first proposed by the Secretary of Agriculture in 1907 (S. Doc. 91, 1st sess., 61st Cong.), and laid down by the National Forest Reservation Commission in its last annual report (S. Doc. 661, 3d sess., 61st Cong.), is now far from complete in these regions. In some areas (already designated for purchase) no acquisitions have so far been made, and some localities ought to be included in purchase areas that are not now included. The Weeks law is not limited to particular States or regions. It is, as it should be, a broadly national bill. Lands ought to be acquired to some extent outside the Appalachian region, as, for instance, in Arkansas and other western States, to round out and complete the present national forests, for the purpose of protecting watersheds of navigable streams.

An excellent beginning has been made on a great construction program that the Federal Government must carry to completion if the interests of the Nation are not to suffer. The organizations represented here have long been fully convinced of the wisdom and necessity of this program. Some of them labored for years for its inauguration. They have watched with deep interest and gratification the results secured under the Weeks law, and their representatives are here now to assure the Secretary of Agriculture of their continued interest and to urge that the program be carried forward without interruption and on a scale commensurate with its importance. A further object of the conference is to consider ways and means of working effectively toward that end.

As the officer of the Government most largely responsible under the law for carrying forward this program, we desire to suggest to the Secretary of Agriculture that, if it meets with his approval, he urge upon the President and Congress the importance of this program and a continuation of the appropriation of funds necessary to carry it on. Our hope is that the Secretary may discuss the matter in his annual report and recommend a continuation of appropriations as recommended by the National Forest Reservation Commission in its annual report at the rate of $2,000,000 a year for an additional period of five years, and also that he will include in his estimates to Congress for the fiscal year 1917 an item of $2,000,000 as a first installment of this appropriation.

ogram of purchases should go on without interruption for the following prin-
ons:
gress has begun the policy. It did so only after long consideration and
and after obtaining convincing proof of its necessity. Under the authority
and the appropriations a good start has been made. An effective procedure
worked out. A force of experts has been trained. The machine which has
ted for the work, and which under the law is somewhat complicated, is in

ould be a great loss to have the program interrupted. The force which it
or three years at the start to get together and train would be lost so that when
is taken up again a new force would have to be gotten together and trained.
uld be lost with the landowners and with it that intimate information as to
veys, and values which is now making the work go forward effectively.
wisdom of the Secretary of Agriculture has been shown in limiting at the
hases to certain specific areas of great importance. But the purchases are
lete in any of these areas, and undoubtedly can not be made so with the
tion already made. If the purchases should stop now the Government would
too high a cost for protecting and administering its lands on account of inter-
rivate lands. Furthermore, the work would not have gone far enough to
h the purpose which the legislation was intended to accomplish.
program is of too great importance to be carried on intermittently. It is of
st national importance that the mountain watersheds be protected so that
ns may be capable of the highest development; so that the soils shall not be
om the mountain sides nor the property of persons or communities ruined
ed by floods which could in part be restrained; so that the river-valley soils
be destroyed as a result of the floods and débris from the mountains.
lly, the continuation of this program is urged as a matter of economy. It is
that it will cost less to carry it on than not to do so. Carried on it will mean
liture of $2,000,000 per year, with some three or four hundred thousand acres
in timber lands passing each year into the hands of the Government to be
l for timber production and to be utilized in many useful ways by the public.
se at any time in the future the property will be worth more than the cost.
gram is not carried on the result will be the certain deterioration of these
fire and by unwise timber cutting and tillage, the loss of at least a portion
s, and likewise a loss in the navigability, power possibilities, and purity of
ns, increasing damage by floods to cities, communities, and persons along the
d also to river-valley soils. And after all this loss has been sustained (and
tainly amount to more than the cost of these lands), the necessity will still
he Federal Government to handle the situation, and the cost of doing so than
reater than it is now.

American Forestry Association, Washington, D. C.; Henry S. Drinker, president, and president of Lehigh University, South Bethlehem, Pa., and P. S. Ridsdale, executive secretary, Washington. Massachusetts Forestry Association, Boston, Mass.; Harris A. Reynolds, secretary, and Allen Chamberlain, Boston. Society for the Protection of New Hampshire Forests, 6 Hancock Avenue, Boston, Mass.; Philip W. Ayres, forester, and delegation. North Carolina Forestry Association, Chapel Hill, N. C.; Hugh MacRae, Wilmington, N. C. Appalachian Mountain Club, Boston, Mass.; Harvey N. Shepard, Boston. Appalachian Park Association, Asheville, N. C.; George S. Powell, secretary. Knoxville Board of Commerce, Knoxville, Tenn.; W. M. Goodman, Knoxville. New Hampshire State Board of Trade, Concord, N. H.; George B. Leighton, Dublin, of the State forestry commission. Western New England Chamber of Commerce, Springfield, Mass.; Frank M. West, Springfield, Mass. Pennsylvania Forestry Association, Philadelphia, Pa.; Herbert Welsh, Philadelphia. Connecticut Valley Waterways Association, Springfield, Mass.; Ashton E. Hemphill, Holyoke, Mass. Southern Commercial Congress, Washington, D. C.; Clarence J. Owens, managing director, Washington, D. C. New Haven Chamber of Commerce, New Haven, Conn.; Charles E. Julin.

[illegible] OF THE SECRETARY OF AGRICULTURE.

[illegible] from the report of the Secretary of Agriculture on the [illegible]

[illegible] The work of [illegible] the Weather Bureau in the past has been [illegible] to the [illegible] Federal [illegible] has been necessary to [illegible] the States. These are in charge of trained [illegible] There [illegible] stations are steadily [illegible] with [illegible] [illegible] [illegible]

ber of Commerce, Sumter, S. C.
iercial Club, Mobile, Ala.
iercial Club, Montgomery, Ala.
iercial Club, Louisville, Ky.
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ention for the Extension of Foreign
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Committee.
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ional Society.
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ry Association and Women's Clubs,
ucah, Ky.
ry Club, University of Michigan.
ien Commercial and Industrial
ociation, Gadsden, Ala.
er Charlotte Club, Charlotte, N. C.
e of Improvement Societies in
ode Island.
National Forest.
facturers' Club, High Point, N. C.
chusetts State Board of Trade.
chusetts Forestry Association.
iants' Association of New York.
iants' and Manufacturers' Associa-
of Milwaukee.
gan Agricultural College.
nal Association of Manufacturers.
nal Association of Box Manufac-
rs.
nal Association of State University
sidents.
nal Association of Cotton Manu-
urers.
National Board of Trade.
National Federation of Women's Clubs and many State and local federations.
National Hardwood Lumber Association, Atlantic City.
National Lumber Manufacturers' Association.
National Slack Cooperage Manufacturers' Association.
National Wholesale Lumber Dealers' Association.
New Century Club, Detroit.
New England Cotton Manufacturers' Association.
New York Board of Trade and Transportation.
North Carolina Legislature.
Pennsylvania State College, Faculty of School of Agriculture.
Pomona Grange of Oregon.
Public Meeting, Alma, Mich.
Public Meeting, Detroit, Mich.
Public Meeting, Jackson, Mich.
Public Meeting, Muskegon, Mich.
Public Meeting, Springdale, Conn.
Public Meeting, Wausau, Wis.
Rhode Island Institute of American Architects.
Science Club of University of Wisconsin.
Sierra Club.
Society for the Protection of New Hampshire Forests.
Trinity College, Durham, N. C.
United States Hay Fever Association.
West Virginia State Board of Trade.
Women's Club, Bay City, Mich.
Women's Club, Eau Claire, Wis.
Wofford College Lyceum, Spartanburg, S. C.

ASSOCIATION OF EASTERN FORESTERS.

e Association of Eastern Foresters, representing the State foresters and other pro-
nal foresters from Maine to Maryland, assembled in Boston, January 19, 1916,
ctfully urge upon Congress the reenactment of the Weeks law (act of Mar. 1,
36th Stat., 961).

have had an opportunity to observe the purchases under this law in seven States
g the past five years, and believe that they have been honestly and skillfully
. We realize, as few others can, their tremendous importance to the protection
vigable rivers.

rthermore, we realize that the fire-protection purposes of the law have fully
ied their reenactment, and we earnestly urge upon Congress the establishment
s fire-protection work on a permanent basis.

Walter O. Filley, State forester, Connecticut; James W. Toumey, director Yale Forest School; John M. Briscoe, University of Maine; F. W. Besley, State forester, Maryland; F. W. Rane, State forester, Massachusetts; Richard T. Fisher, Harvard Forest School; E. C. Hirst-State forester, New Hampshire; Alfred Gaskill, State forester, New Jersey; C. R. Pettis, State forester, New York; Hugh P. Baker, New York State College of Forestry; Ralph S. Hosmer, director Cornell Forest School; George H. Wirt, State forest inspector, Pennsylvania; Austin F. Hawes, State forester, Vermont; Philip W. Ayres, forester, Society Protection, New Hampshire Forests; John Foley, forester, Pennsylvania Railroad; H. R. Bristol, Delaware & Hudson River Railroad.

RESOLUTION ADOPTED BY BOARD OF DIRECTORS OF SAN FRANCISCO CHAMBER OF COMMERCE.

DECEMBER 21, 1915.

Whereas the Weeks Act for the protection of forest land at the headwaters of navigable streams is beneficial to sections of the Pacific coast; and

Whereas it carries out in nine Eastern States a national policy of forest purchase, essential to the welfare of those States and indirectly of the whole country: Therefore be it

Resolved, That the San Francisco Chamber of Commerce favors an extension of the Weeks Act by Congress and the acquisition under it of lands approved and recommended by the Secretary of Agriculture, and

Resolved, That this action be communicated to the California delegation in Congress.

I hereby certify that the above is a true copy of a resolution adopted by the board of directors of the San Francisco Chamber of Commerce at a meeting held December 21, 1915.

B. M. KING, *Secretary*.

LOS ANGELES CHAMBER OF COMMERCE.
Los Angeles, Cal., November 18, 1915.

Mr. PHILIP W. AYRES,
6 Hancock Avenue, Boston, Mass.

DEAR SIR: Referring to your communication of the 15th instant, together with inclosure, I take pleasure in stating that our board took favorable action on your request relative to the Wee'ks bill by reiterating its former action, requesting that the act include the western territory as well as the eastern.

Trusting this will be entirely satisfactory to you,

Yours, very truly,

FRANK WIGGINS, *Secretary*.

MINNEAPOLIS CIVIC AND COMMERCE ASSOCIATION,
Minneapolis, January 8, 1916.

Mr. PHILIP W. AYRES,
Forester, Society for Protection of New Hampshire Forests,
Boston, Mass.

DEAR SIR: At the last meeting of the board of directors the following resolution with reference to the Weeks Act was adopted:

Whereas the adoption of the amendment providing for the extension of the work appropriated for in section 3 of the act of March 1, 1911 (36 Stat., p. 961), entitled "An act to enable any State to cooperate with any other State or States or with the United States for the protection of the watersheds of navigable streams and to appoint a committee for the acquisition of lands for the purpose of conserving the navigability of navigable rivers," will make possible the continuance of Federal aid to the State of Minnesota in the work of protecting Minnesota's forests against devastation by fire: Be it

Resolved by the board of directors, That this organization heartily approve the adoption of this amendment and urge the adoption upon Members of the congressional delegation from this State.

Our Representatives in Congress have been notified of this action.

Yours, very truly,

HOWARD STRONG, *Secretary*.

COMMERCIAL CLUB OF OMAHA,
Omaha, Nebr., December 23, 1915.

Mr. JAMES A. MCKIBBEN,
Secretary Chamber of Commerce,
Boston, Mass.

DEAR SIR: The following resolution was unanimously adopted by the Commercial Club of Omaha and copies have been sent to our Representatives in Congress:

"We, the Commercial Club of Omaha, indorse the recommendation of the Secretary of Agriculture that further appropriations be made for the purchase of additional lands in the White Mountains and southern Appalachians and recommend the proposition to the favorable consideration of our Senators and Representatives in Congress."

Yours, very truly,

ROBERT H. MANLEY, *Secretary.*

RESOLUTION APPROVED BY FREDERICK W. GRIFFITH, CHAIRMAN OF LEGISLATIVE COMMITTEE OF THE PORTLAND, OREG., CHAMBER OF COMMERCE.

Whereas the Weeks Act for protection of forest land at the headwaters of navigable streams is beneficial to Oregon in assisting the State authorities to suppress forest fires; and

Whereas it carries out in nine Eastern States a national policy of forest purchase essential to the welfare of those States and indirectly of the whole country: Therefore be it

Resolved, That the Portland Chamber of Commerce favors an extension of the Weeks Act by Congress, in order to acquire lands approved and recommended by the Secretary of Agriculture, and authorizes and instructs its secretary to communicate this action to members of the Oregon delegation in Congress.

RESOLUTION OF SPOKANE CHAMBER OF COMMERCE.

Whereas the Weeks Act for protection of forest land at the head of navigable streams is beneficial to the State of Washington in assisting the State authorities to suppress forest fires, and may become valuable in protecting the mountain streams for the purpose of irrigation; and

Whereas this act carries out in nine eastern States the policy of forest purchase that is essential to preserve the water power in those States: Therefore be it

Resolved, That the Spokane Chamber of Commerce favors an extension of the act by Congress to acquire the land approved and recommended by the Secretary of Agriculture, and authorizes and instructs its secretary to communicate this action to members of the Washington delegation in Congress.

CHAMBER OF COMMERCE,
Seattle, Wash., December 11, 1915.

Mr. PHILIP W. AYRES,
6 Hancock Avenue, Boston, Mass.

DEAR SIR: Concerning your interview with Senator S. H. Pyles, chairman of the committee on national affairs, and your letter addressed to him, I have the honor to advise you that the board of trustees, Friday, December 10, formally approved the following, presented by the national affairs committee:

"Recommending that the chamber of commerce favor an extension of the Weeks Act providing for the protection of forest land at the headwaters of navigable streams, this extension of the act being to authorize the acquisition of lands approved and recommended by the Secretary of Agriculture. In the judgment of students of the subject, this extension is necessary in order to make the protection effective on important watersheds."

This recommendation will be communicated to each of the Members of the House of Representatives and the two Senators from the State of Washington.

Yours, very truly,

C. B. YANDELL, *Executive Secretary.*

RESOLUTION OF THE WESTERN FORESTRY AND CONSERVATION ASSOCIATION.

SAN FRANCISCO, *October 19, 1915.*

The [illegible] States of California, Oregon, Washington, Montana, and [illegible]

[illegible] the achievements of [illegible] under the Weeks law for the protection [illegible] forests, to be perhaps the most [illegible] State effort, but also of cement- [illegible] harmonious and effective whole. Its [illegible] immeasurably beyond its cost.

[illegible] an experiment no longer, and that it be [illegible]

[illegible] to insure economic and advantageous ex-

[illegible] Secretary of Agriculture that further [illegible] additional lands at the headwaters of [illegible] and southern Appalachians, and instruct [illegible] Congress assembles, to urge their Sena-

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SAVANNAH BOARD OF TRADE,
Savannah, Ga., January 25, 1916.

[illegible]
[illegible], D. C.

[illegible] preambles and resolutions passed by [illegible] an extension of the appropriation to co- [illegible] New England and the southern [illegible] Weeks law.

THOMAS PURSE, *Secretary.*

[illegible] SAVANNAH BOARD OF TRADE JANUARY 22,

[illegible] the appropriation of $8,000,000 made [illegible] has been used in the purchase of lands in [illegible] Mountains for the purpose provided for in

[illegible] lands have been economically pur- [illegible] present condition as to areas and co-

[illegible] is known by that these purchases be [illegible] by the National Forest Reservation Com-

[illegible] Board of Trade, That the United States [illegible] in this congressional district be [illegible] an appropriation of $10,000,000, [illegible], for the purchase of additional

[illegible]

THOMAS PURSE, *Secretary.*

NATIONAL LUMBER MANUFACTURERS ASSOCIATION,
[illegible], January 19, 1916.

[illegible]
[illegible], Washington, D. C.

[illegible] you will be glad to know that at the meeting of the executive [illegible] National Lumber Manufacturers Association, held in Chicago this [illegible] the extension of the Weeks law was discussed, and we [illegible] as possible a statement upon the subject to go to all of [illegible] organizations.

Sincerely yours,

R. S. KELLOGG, *Secretary.*

CHICAGO, *December 8, 1915.*

Mr. PHILIP W. AYRES,
Forester, Society for the Protection of New Hampshire Forests,
Boston, Mass.

DEAR SIR: We are in receipt of your letter of December 6, to Mr. Frederick L. Brown, general secretary, and desire to correct the impression that any "decision to postpone action" on the so-called Weeks Act has been made.

The Chicago Association of Commerce is on record as having supported the Weeks law, and to that end cooperated with the Appalachian Park Association, the Boston Chamber of Commerce, the Massachusetts Forestry Association, and other interested organizations.

It is true that the Chicago Association of Commerce has not yet acted upon the extension of the Weeks law, neither has it postponed action, and the matter will, under the rules of the association, receive consideration as soon as it becomes the subject of pending legislation, and a copy of the bill, as introduced in Congress, is received. The Association of Commerce, as a matter of long-standing policy, acts only upon pending legislation. It does not initiate legislation, nor does it take a position on suggested legislation, and the subject matter of your letter will be given attention by the proper committees as soon as practicable.

Very truly, yours,

CHICAGO ASSOCIATION OF COMMERCE,
By H. F. MILLER, *Business Manager.*

COMMERCIAL CLUB OF KANSAS CITY,
January 12, 1916.

Mr. PHILIP AYRES,
Forester, Society for the Protection of New Hampshire Forests,
Boston, Mass.

DEAR SIR: I am in receipt of your letter of January 1, with which you inclosed memorial to the Secretary of Agriculture copies of form of amendment to House Agricultural bill and resolutions adopted by the Chambers of Commerce of Los Angeles, Seattle, and others.

I have already taken up this subject with our board of directors and they have referred it to our committee on State and National legislation, but, owing to the changes incidental to the first of the club year, the committee has not met to consider this and a number of other subjects which have been referred to them. I hope, however, to have them become interested in the very near future, and will then advise you of their action.

Yours, very truly,

E. M. CLENDENING, *General Secretary.*

LETTER SENT TO MEMBER OF COMMITTEE.

NEW YORK, N. Y., *January 24, 1916.*

Hon. JOSEPH HOWELL,
Committee on Agriculture, House of Representatives.

DEAR SIR: In behalf of the farmers of America and all of the people of the New England States, permit me to earnestly advise adequate appropriations for the furtherance of the Government's policy toward extending the forest reserves in the White Mountains and the Appalachians and other sections. I wholly indorse the memorial of September 23, 1915, to the honorable Secretary of Agriculture on this subject from the American Forestry Association and kindred interest.

My own ownership of lands, West and East, my years of personal observation and study of forestry in North America and also in Europe unite to convince my judgment that the Government forestry policy is right if adequately continued under proper administration.

In addition to all the well-established facts—not merely arguments—which combine to confirm this opinion I wish particularly to emphasize:

(1) Close relation between proper forestry and navigation, irrigation, drainage, water power, and electricity for power, light, and heat.

(2) Any adequate policy, national or legal, for conserving and utilizing these people's priceless water supplies is dissolubly bound up with adequate forestry.

[illegible] of the Appalachians [illegible] the national [illegible] and the waters [illegible] the Appalachians on [illegible] west as [illegible] useful service instead of three years [illegible] matter [illegible] forests and forestry in general will render [illegible] timber waters as shall bless our people in [illegible] for harnessing the Mississippi and its tribu-

[illegible] our committee agree with these views and that [illegible] will show to their members of House and [illegible] that your action [illegible] of this great national

Herbert Myrick,
President American Farm Press.

[illegible] the Grange Field Farm Weeklies—Northwest [illegible] Farmer on the right, Southern Farming of [illegible] Western New England Homestead (Springfield, [illegible] Rural New Yorker and the Rural World of St. Louis, [illegible] from [illegible] and [illegible] of readers,

[illegible] 1,200,000 subscribers, one of the most [illegible] United States. We believe that the above [illegible] 9,000,000 cattle

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Ithaca, N. Y., January 31, 1908.

[illegible] Cornell University, [illegible] the [illegible] the Grange in all the [illegible] in favoring the [illegible] bill.

Liberty H. Bailey.

[illegible] privilege of presenting to [illegible] Senator.

STATEMENT OF THE HON. JOHN W. WEEKS, UNITED STATES SENATOR FROM THE STATE OF MASSACHUSETTS.

[illegible] I believe [illegible] to [illegible] [illegible] [illegible]

Having been interested in the original legislation, I have naturally tched the way the law has been carried out and my interest in it d my judgment in favor of it has not wavered in the slightest. have no doubt that the definite provision, for the prevention of ds, made in the original law for cooperation with the States has ved many times the amount of money which the Government propriated for the purchase of these lands. And I do hope that e committee will not look on this movement as a temporary one. is far-reaching and should be carried on indefinitely. There are eat areas in the United States which are not available for any other rpose than the raising of wood. Every other nation in the world s taken up this general movement of reforesting such areas, and I lieve the time has come in the United States when we should ntinue definitely to do that.

Some States and some communities are already doing it. I think heard a Member from Pennsylvania say that the State of Pennsylnia (and I know it is true) is appropriating considerable amounts money for the purpose. The State of Massachusetts is doing someing in the same direction. The Pennsylvania Railroad is reforting its lands which are not needed for railroad purposes.

And this law is not alone applicable to the State where the forests e, or to their immediate neighborhood, but it is just as necessary you gentlemen who live in the States where you do not raise od, where you do not raise trees, because in the long run it is going have a material influence on the price of wood and of lumber in the nited States.

Mr. HELGESEN. Senator, what do you mean by "wood"? You now there are a good many definitions of "wood."

Senator WEEKS. I am speaking in general terms of lumber when I y that. We are going to come to the time, perhaps not in our life mes, but we are going to come to the time when every acre of land hich is not available for other purposes should be raising lumber for e benefit of the people in this country.

And, therefore, in this modest way it seems to me altogether sirable that this law should be continued, and that at least at this me Congress should reappropriate the amount of money which has psed on account, and only on account, of the great care with which e law has been carried out since it has been upon the statute books.

Mr. CANDLER. We are glad to have heard you, Senator.

STATEMENT OF DR. JOSEPH HYDE PRATT, STATE GEOLOGIST OF NORTH CAROLINA.

Dr. PRATT. Gov. Craig is absent from the room for a few minutes d has left me in charge. Before I call on the next speaker, I would e to say one word in reference to the matter that was presented 1911 which resulted in the passage of the Weeks bill. The propoion as a whole was presented to the committee and to Congress, hich contemplated the purchase of a certain definite number of res in the White Mountains and the Appalachians, and we are ming back now to ask that the appropriation may be continued that we can carry out the policy and what was contemplated at e original meeting. As Mr. Hollis has shown to you, the same terests that asked for an appropriation then and the carrying out

of the policy, believing it has been done in the right way, are now asking for a continuation of the appropriation to enable our commission to carry out the purpose of Congress at that time and to continue the purchase of these lands in order to fulfill the original policy.

I want to present at this time Hon. Harvey N. Shepard, of Massachusetts, representing the Appalachian Mountain Club.

STATEMENT OF MR. HARVEY N. SHEPARD, OF BOSTON, MASS.

Mr. SHEPARD. Mr. Chairman and gentlemen of the committee, because of the pressure upon your time I am not going to trespass upon your attention to consider the commercial aspects of this matter, such as the importance of the forests in holding back the water in times of perpetual floods, to keep our rivers navigable, to provide water power and to generate electricity to light our roads and run our street cars. I recognize the importance of these and that they are the constitutional and legal basis of the bill, but in accomplishing these it has also accomplished something more, and it is to this that I ought to call your attention for a few minutes.

I shall speak from the standpoint of one who loves the mountains and the forests which cover them for what they are and not because by their commercial use they can put money into our purses, but because they are a blessing to our bodies and an uplift to our souls. I have no sectional sentiment, and I have no quarrel either with the West or with the forests which it represents. I was introduced as representing New England, and I believe I do represent New England in the sense for the favorable action on your part; but my real position is that of a delegate only that of a delegate from the Appalachian Mountain Club, a club which was formed 40 years ago to make accessible the passes and remote places of the White Mountains, then known, with one or two exceptions, only to the lumbermen and the prospector. Its first president was Prof. Pickering, the eminent astronomer of Harvard University, and its present president is Percival Lowell, also an eminent astronomer of world-wide fame for having shown us how the people of Mars conserve their water supply.

Our club now numbers 2,000, mainly, of course, in Massachusetts, its home, but having membership all over the Union, even as far west as the Pacific coast. We have built paths and established camps, so that people, who are not expert climbers can travel in safety through the whole region. In the September gale of last year five persons, who were caught suddenly by a severe storm at the foot of the cone at Mount Washington, would, undoubtedly, have perished had they not found shelter in one of our stone huts. I wish you could have seen what I saw a year ago last summer: 29 girls, all from Michigan, climbing the peak of Mount Adams, and the following morning 33 other girls just entering the forest at its foot. You would have been delighted by the enjoyment of these girls, and in the knowledge of the health it was bringing to their bodies and to their minds.

The national forests, the national parks, and the national monuments are located in the West, and it is possible for some of us to see them. We are glad they have been established and that the people of the country can enjoy them. But the great mass of our people in New England never can see them, and it is therefore we ask you to give us a national forest in the White Mountains which we can

joy. We appeal to you, gentlemen, to save to us these mountains. you do not continue this bill, the lumbermen will sweep away these es, and when they have cut the forest off of the mountains, the ins and the fires will destroy the soil and leave nothing but the bare letons. We love the mountains, we love the forests which are them; and we beg of you, gentlemen, to preserve them to us, not one because of the navigation of the streams, not alone for commer- reasons, important as all those are, but also because with those mmercial uses and not interfering in the least with them we can ake those mountains places where thousands of people can go, t as they traverse now the mountains of Switzerland and the Tyrol did, before this horrible war; and, gentlemen, we beg of you to ve these mountains to us with the forests on them that we may enjoy em not only in our own generation, but that the generations to me may also find delight in them and health and vigor of body d mind.

I thank you, gentlemen.

Dr. PRATT. I wish to present Mr. George S. Powell, Asheville, N. C., representing the Appalachian Park Association, who will state hat the Southern States desire the continuation of the appropriation or the purchase of the forest lands.

STATEMENT OF MR. GEORGE S. POWELL, OF ASHEVILLE, N. C.

Mr. POWELL. Mr. Chairman and gentlemen, in 1899 an organization was formed by a number of southern men for the purpose of bringing to the attention of Congress the importance of the National Government's acquiring nonagricultural lands in the southern Appalachian and White Mountains, for the general purpose, first, of securing a perpetual growth of forests at the headwaters of navigable streams and thereby giving protection against the destruction of the soil; second, the preservation of water powers; third, the preservation of the purity of the streams having their sources in those mountains; fourth, the preservation of the timber and to provide lands where timber could be cheaply grown for future use; and last, but by no means the least important, preserving what, under the conditions existing at that time, would have been largely destroyed—the wonderful beauty and attractiveness of those mountain regions for the recreation and pleasure of the people.

We saw public sentiment in support of this movement go to the extent that in 1911 the Weeks law was enacted. A few years ago, realizing that if the work so well begun and carried on by the National Forest Reservation Commission and the Forest Service was to be successfully completed, as proposed in the original plan, that it would be necessary for Congress to make an additional appropriation, we again went to work to bring this matter to the attention of the different organizations throughout the country. And we succeeded in securing the indorsement of the general purposes that are embodied in the amendment that you are now considering, of the Chicago Association of Commerce; the Merchants' Association of New York; the Business Men's League of St. Louis; the New Orleans Association of Commerce; the Chamber of Commerce and Business Men's League of Mobile, Ala.; the Chambers of Commerce of Augusta, Ga.,; Chattanooga, Tenn.; Charlottesville, Va.; Fayetteville, N. C.; Henderson-

l to denudation of forest lands constituted a very serious menace to both navi- n and water power, for the uncontrolled run-off of rainfall from steep deforested not only tended to diminish both navigation and water-power possibilities but our streams and storage ponds with débris to an appalling amount. The direct its to these two important subjects due to the areas already acquired would be ılt to estimate, though they are direct, tangible, and demonstrable.

ond. There is a real and tangible benefit in the object lesson taught the States ndividual owners of forest lands through the scientific care and management of overnment areas. There can be no doubt that the vast work involved in ade- watershed protection and timber supply must, to be effective, enlist the aid ooperation of the States and individual owners themselves, and in bringing this cooperation the national example is extremely valuable. Already several have enacted forestry laws, have appointed State foresters, are taking stock ir forest resources, are guarding against fire, etc., directly because of the Weeks nd its example. It is this phase of the subject, viz, State cooperation, that irectly concerns the work of the forestry committee of the Southern Commercial ees and which enables us to intelligently speak of the results already accom- d and in contemplation throughout the South.

consider that it would be a national calamity were this work not continued by natic appropriations, and it is our earnest hope that your committee will find it le to include the appropriation recommended by the Secretary of Agriculture e furtherance of this work.

spectfully submitted.

SOUTHERN COMMERCIAL CONGRESS,
By JOHN H. FINNEY,
Chairman Forestry Committee.

r. PRATT. Our next speaker is Mr. Harold M. Parker, chairman he Massachusetts Forestry Commission, representing the Com- wealth of Massachusetts and Gov. McCall.

STATEMENT OF MR. HAROLD M. PARKER.

r. PARKER. Mr. Chairman and gentlemen, it seems to me entirely ecessary now to take up your time. This matter has been pre- ed to you by the most able minds. You have been able to com- the sentiment we have in Massachusetts by the two speakers, Senator and Mr. Shepherd, showing you what our sentiments are. ou have had Mr. Hollis, from New Hampshire, who has presented thing to you in a general way, and in such a way that I do not how it is possible for you to decline to accept his arguments. I efore do not think I want to take up your time.

will simply say to you that I am here at the request of the gov- or of Massachusetts, representing the new commission which has n up on the part of the State of Massachusetts something very lar to what we are asking you to do for the Government of the ted States; that is, Massachusetts has adopted a policy of acquir- by purchase lands in the State which are now absolutely unpro- tive even for the purpose of saving or augmenting the flow of the ams. We believe, and have for a long time, that the industry umbering is rapidly getting away from us, and that we have no ıal solid defense, and it is necessary for us to take steps for the ervation of our lumber, because before we know it our lumber be gone, and nothing will be there to take its place.

r. CANDLER. How much is the State expending in this direction?

r. PARKER. The appropriation by the State was $90,000, to be it for the purchase of land, with the idea of having all of this land rested at the expense of the State by the State forester.

r. CANDLER. Is that $90,000 a year?

[illegible] It is [illegible] the purchase of these [illegible] the State forester [illegible] The request was made of the [illegible] was determined by [illegible] expenditure of $20,000 [illegible] the State has done so [illegible] acres of land at an average [illegible]

[illegible] commission which took possession of [illegible] in the eastern part [illegible] been practicing forestry. [illegible] protection against fire, [illegible] been put generally throughout [illegible] showing that we took [illegible] asset to the State out [illegible] We believe and are con- [illegible] small reservation will have [illegible] country's forest [illegible] unnecessary for me to argue this [illegible] understand it [illegible] Mr. The National Forest Reservation Commission, in its report has [illegible] that is, that it is unnecessary [illegible] orderly, systematic way [illegible]

[illegible] Mr. Chairman, therefore, that I will simply leave it without [illegible] You have all the information that is [illegible] upon the question. I thank you.

Mr. CANFIELD. We are glad to have heard from you.

Mr. MCLAUGHLIN. Mr. Chairman, this gentleman told us very interesting [illegible] what Massachusetts is doing. We of the committee and other Members of Congress know that many times the people in one part of the country at one time, and in another part of the country at another time, ask Congress for appropriations to carry on work which it is felt the States themselves ought to do. Now I think it would be of interest and helpful in meeting that objection if the representatives of the States would furnish us with testimony as to what the States are doing, the amount of money that they are appropriating, and the means that they are employing to carry out this work themselves and to assist and cooperate with the Federal Government in carrying on this work.

Mr. SHEPHERD. Could we do that in writing after the meeting? We can very readily do that for Massachusetts.

Mr. MCLAUGHLIN. We have not the time to hear the gentlemen from the several States, but I would suggest that someone take up the work of putting this information in the record.

Dr. PRATT. I would suggest, then, that the Forest Service and the State foresters within the various States to prepare such information and submit it to your committee at just as early a date as is possible.

Mr. GRAVES. Mr. Chairman, we already have a great deal of information and we can supplement that and get such a statement for [illegible]

[illegible]. Without objection, then, we will have that put in [illegible]

[illegible] follows:)

OREST ACTIVITIES OF THE SEVERAL STATES IN THE GENERAL REGIONS AFFECTED BY PURCHASES UNDER THE WEEKS LAW.

Maine.—Annual appropriation for forestry work, $71,400, of which $1,000 is expended for investigations and publications, $69,400 for fire protection, and $1,000 for nurseries and reforestation work.

New Hampshire.—Annual appropriation for forestry work, $38,800, of which $9,400 is expended for investigations and publications, $20,900 for fire protection, $3,500 for nurseries and reforestation work, and $5,000 for the purchase of waste lands for State forests.

Vermont.—This State makes an annual appropriation of $19,500, of which $6,000 is expended for administration, publications, and investigations, $2,000 for fire protection, $4,000 for nurseries and reforestation work, and $7,500 for the purchase of State forests.

Massachusetts.—Total annual appropriation for forestry work, $83,000, for administration, publications, and investigations the amount expended is $20,000, for fire protection $33,000, for nurseries and reforestation work $10,000, and for the purchase and maintenance of State forests $20,000.

Connecticut.—Total annual appropriation for forestry $7,500. Of this amount $2,500 is expended on administration, publications, and investigations, $3,500 for fire protection, and $1,500 for the purchase and maintenance of State forests.

Rhode Island.—Expenditures for forestry, $3,000, $1,500 of which is for publications and investigations and $1,500 for fire protection.

New York.—Total appropriation for forestry work, $177,840; amount expended for administration, publications, and investigations, $26,340; fire protection, $100,000; for nurseries and reforestation work, $35,000; for purchase and maintenance of State forests, $16,500.

New Jersey.—Total appropriation for forestry, $43,000, of which $11,500 is expended for administration, publications, and investigative work, $21,500 for fire protection, and $10,000 for purchase and maintenance of State forests.

Pennsylvania.—Total appropriation for forestry, $315,375. Expended for administration, publications, and investigations, $51,000; for fire protection, $100,000; for nurseries and reforestation work, $20,000; for purchase and maintenance of State forests, $144,375.

Maryland.—Total appropriation for forestry work, $10,000, of which $5,000 is expended for administration, publications, and investigations, $3,000 for fire protection, and $2,000 for the purchase and maintenance of State forests.

Virginia.—Total appropriation for forestry work, $5,000, all of which is to be expended in investigations and educational work.

West Virginia.—Total appropriation for forestry work, $10,000, all of which is expended in fire protection.

North Carolina.—Total appropriation, $23,000, of which $3,000 is expended for administration, publications, and investigations, and $20,000 for the purchase and maintenance of State forests.

Tennessee.—Total appropriation, $3,000, which is expended in investigative work.

Kentucky.—Total appropriation, $15,000, of which $5,500 is expended for administration, publications, and investigative work, $4,000 for fire protection, $2,500 for nurseries and reforestation work, and $3,000 for the purchase and maintenance of State forests.

Alabama.—Total appropriation, $500, which is all expended in investigative work.

Dr. PRATT. There is one other gentleman I desire to present to you, Mr. I. C. Williams, deputy forester of the State of Pennsylvania, who represents not only the State but the governor of Pennsylvania.

STATEMENT OF MR. I. C. WILLIAMS.

Mr. WILLIAMS. Mr. Chairman, and gentlemen of the committee, the attitude of Pennsylvania on this proposition is one of complete and emphatic approval and I am here to ask your committee to do what is in your power, namely, to continue this appropriation.

We believe, sirs, indeed we feel we know in Pennsylvania, that the continuation of the work is a national necessity, and we feel it would

is no objection to that, the information
cord. Is there anything further?
been very patient with us, in giving us this
are several others here whom we would like
nute or two, if the committee would like to

be very glad to hear them.
ig reentered the room.)
nan, I present to the committe, Mr. W. O.
an., State forester of Connecticut.

W. O. FILLEY, NEW HAVEN, CONN.

nan and gentlemen of the committee, I am
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and of the policy inauguated in regard to
national forests in the White Mountains and
s. The State of Connecticut has only an
matter. Our interest is in the river
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lwaters are assured of protection. We feel
is national forest in the White Mountains
nd great to New England as a geographic
ortant to the country at large, and we feel
erest in the Appalachian National Forest,
the South have an interest in the White
we have an interest in the Appalachian
we wish to express approval of the act and
ated and we hope that it will be continued.
nan and gentlemen, with your permission,
mes, of Boston, representing the American
peak briefly to the committee.

R. JOHN S. AMES, BOSTON, MASS.

n and gentlemen, I represent the American
you may know, the American Forestry
000 members, scattered throughout every
most of the civilized countries abroad. At
on it passed a resolution heartily indorsing
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the Appalachian and White Mountains.
ociation as I do, I wish to say that we will
ncourage further work along similar lines
ing the last four or five years under the

lad to have heard from you.
ent Mr. Frank M. West, representing the
mber of Commerce.

STANFORD LIBRARIES

be a mistake to have a hiatus occur at this time when the work is well started, although scarcely more than in its inception.

For ourselves in Pennsylvania, we are not asking for a dollar of the money. We do not expect that a dollar of this appropriation will be spent in our State. We are doing our own forest work. We are spending over $300,000 a year in that project, and a very large part of our effort is directed toward the preservation and continuation of the State water supply. That also, incidentally, affects neighboring States. We believe that the time will come (it may not be in your time or in mine) when the Susquehanna River will be made navigable from the head of the Chesapeake Bay to the New York State line, and then, by short canals, will connect with the Great Lakes, Ontario and Erie, and westward, with the Ohio River system. When that time comes and when the proper arm of the National Government sees fit to make that development, as we believe it will, the hills and mountains of Pennsylvania will be in State ownership, fully forested and ready to supply their quota of water, which at that time will be so necessary for that purpose.

We believe, sir, that the project looks in another direction. We are trying it out in our own State. We believe that the question of recreation for our people is becoming a more pertinent one year by year. As the lands are developed and maintained in private ownership, the natural disposition of the owner is to lock them up and to shut out the man who has no land. In our State we invite the citizens of Pennsylvania and of our sister States to come into the State forests and to camp there and to live there and enjoy those woods. We believe, we feel, that play is as necessary and as essential for human beings as work, and we believe it is just as necessary for the aged man and woman as it is for the tiny boys and girls. We have recently executed over 200 leases for permanent camp sites in the State forests of Pennsylvania and we confidently feel that the extension of the project that is now in your hands will ultimately develop in that direction, and that the national forests in the western parts of the United States will become playgrounds for our people.

I thank you.

Mr. CANDLER. We are very glad to have heard you, sir.

Dr. PRATT. Now, Mr. Chairman and gentlemen of the committee, I would like to ask Mr. Graves to say just a sentence in regard to what appears to us important, to correct a misapprehension, perhaps, on the part of some of the members of the committee in regard to the price paid for these lands—just a short statement from him to be included in the record.

Mr. GRAVES. In Mr. Hollis's remarks regarding our appraisal of the forest lands in New Hampshire, I think there might have been conveyed an impression that we appraise lands differently from what is ordinarily the custom. I want to say that the prices paid by the Government are not higher than the ordinary commercial values, but are, in many cases, lower than the current values.

Dr. PRATT. There is one other request I would like to make, and that is for permission to submit for publication in the record the names of the governors and the States represented, and the various organizations, and the different people represented, so that the committee will have some idea of the personnel and the territory represented by the men attending this meeting.

Mr. CANDLER. If there is no objection to that, the information may be inserted in the record. Is there anything further?

Dr. PRATT. You have been very patient with us, in giving us this amount of time. There are several others here whom we would like you to hear from for a minute or two, if the committee would like to hear them.

Mr. CANDLER. We will be very glad to hear them.

(At this point Gov. Craig reentered the room.)

Gov. CRAIG. Mr. Chairman, I present to the committe, Mr. W. O. Filley, of New Haven, Conn., State forester of Connecticut.

STATEMENT OF MR. W. O. FILLEY, NEW HAVEN, CONN.

Mr. FILLEY. Mr. Chairman and gentlemen of the committee, I am here at the request of the governor of Connecticut to express approval of the Weeks Act and of the policy inauguated in regard to the purchase of lands for national forests in the White Mountains and the southern Appalachians. The State of Connecticut has only an indirect interest in the matter. Our interest is in the river Connecticut. The navigable portion of the river Connecticut is in our State. That may possibly, in the future, be extended up into Massachusetts, if the headwaters are assured of protection. We feel that the importance of this national forest in the White Mountains is great to Connecticut and great to New England as a geographic unit, and we feel it is important to the country at large, and we feel also that we have an interest in the Appalachian National Forest, and that the people of the South have an interest in the White Mountains, the same as we have an interest in the Appalachian Mountains and therefore we wish to express approval of the act and the policy already inaugurated and we hope that it will be continued.

Gov. CRAIG. Mr. Chairman and gentlemen, with your permission, I will ask Mr. John S. Ames, of Boston, representing the American Forestry Association, to speak briefly to the committee.

STATEMENT OF MR. JOHN S. AMES, BOSTON, MASS.

Mr. AMES. Mr. Chairman and gentlemen, I represent the American Forestry Association. As you may know, the American Forestry Association has about 9,000 members, scattered throughout every State in the country and most of the civilized countries abroad. At its annual meeting at Boston it passed a resolution heartily indorsing the purchase by the Government of forest lands at the headwaters of navigable streams in the Appalachian and White Mountains. And, representing the association as I do, I wish to say that we will do all in our power to encourage further work along similar lines which has been done during the last four or five years under the Weeks law.

I thank you.

Mr. CANDLER. We are glad to have heard from you.

Gov. CRAIG. I now present Mr. Frank M. West, representing the western New England Chamber of Commerce.

STATEMENT OF MR. FRANK M. WEST.

Mr. WEST. Mr. Chairman and gentlemen, I may say the Western New England Chamber of Commerce consists of business men's associations of nearly all the towns and cities in western New England. Also, I am here at the request of the board of trade handling county improvement work and the Connecticut Valley Waterways Commission.

They all heartily approve of further appropriations under this act; and I would like to say, also, that the concern with which I am connected is actively engaged in similar work to that which is being done on a large scale under this act by the Government. Taking it from the timber end, we feel that the Government is doing a work that is not only absolutely necessary, but, we believe, will be very profitable.

Mr. CANDLER. We are glad to have heard from you.

Gov. CRAIG. Mr. Chairman and gentlemen of the committee, I do not desire at all to trespass on the time of this committee and we appreciate the patient hearing that you have given us, but I have been asked to say a word in closing.

Mr. CANDLER. We will be glad to hear from you, Governor.

STATEMENT OF HON. LOCKE CRAIG, GOVERNOR OF NORTH CAROLINA.

Gov. CRAIG. I do not know that I can say anything in addition to what has been said. I know but little of the details of this subject, but I am well acquainted with the mountain section of our country and am pretty well acquainted with the result that the purchase of these lands has had upon our mountain sections and, consequently, upon the streams that originate in our mountain section; and I suppose that the conditions which exist in the South are about the same as the conditions that exist in New England.

It is imperative that something be done to protect the forests or to save the forests in this country, otherwise they will be destroyed. The people that own these forests have a right to cut them down, and timber has advanced so much in price and so much in value that they are now proceeding to denude the mountains of the South of the finest growth of timber, I suppose, that exists anywhere in the eastern part of America.

When I can first recollect, the Appalachian Mountains were clothed with a most luxurious growth. Timber at that time was of little value and the land could be purchased very cheap, and some of it, under the Weeks law when it was first enacted, was purchased very cheap. A great deal of it was not. But now in those areas that have been used for commercial purposes, in place of a vast, luxurious growth, of the finest timber, there is nothing but barren desolation and blackened waste.

As I say, the mountains are covered with most luxuriant timber, and when this timber is cut down by the lumber men (and it is cut clean almost, because in order to get it out they have to build railroads out into the mountains, and when they do build a railroad there they try to get all that they can) the ground is left covered with laps and the limbs of the trees and it becomes very difficult of

ontrol and it is impossible to prevent fires, because if nothing else ill set them on fire, the lightning will set fire to the woods and reat conflagrations sweep over them with terrific violence; and they urn up everything; they burn up every tree that has been left and urn down into the soil, so that where a few years ago we found the ountain slopes covered with the most luxuriant and richest growth, here is now vast desolation and blackened ruin. And there is othing there to absorb and conserve the water, and great gullies re beginning to wash out, and they are washed out there now so hat you could put great buildings or long freight trains into those ullies. And, of course, the more they wash the more rapid the evastation becomes.

The mountains of the Appalachian system were formed by erosion nd denudation. They were at one time said to be the highest ountains on the globe and composed part of great plateaus between he Mississippi Valley, and perhaps included the Mississippi Valley he Atlantic slope. And we are told that the great rains in the prineval days washed out the valleys and left the mountains standing; ut after ages the processes of nature gained the advantage over the ction of the elements, and finally the mountains were clothed in the ichest green.

And when this growth is taken off the process of erosion begins gain and begins not to be stopped except after another age, when he process of nature will assert itself. And all the navigable streams hat rise in the Appalachian Mountains are affected, and, as it has been the established policy of the Federal Government to protect he navigable streams, it would not be objectionable, of course, to his measure that while the navigable streams were protected as highways of commerce the other uses to which the streams should be put were also conserved and remembered. The greatest water powers that we have originate in the Appalachian Mountains. A water power is valuable, but its value is determined by its value at the low water mark. And now the mountains are the reservoirs of these streams, and during the time of heavy rainfall in the winter this water is conserved and made available in the dry months of the summer. When these mountains are denuded of the forests which conserve the water, the rainfall, in place of being absorbed on the mountains and coming out in the springs in the summer time, sweeps down in great floods, fills up the streams, and destroys their value as water powers and destroys their value for purposes of navigation.

I have seen some of the finest streams in North Carolina and broad fertile valleys bordering on our rivers absolutely ruined, and they are now barren sand banks, because the mountains were denuded of their forests. There was no conservation there of the water, and it swept down in great floods, carrying everything before it.

If you gentlemen could see, as many of you have seen, the processes of denudation going on there now, why you would see in the Appalachian Mountains the very same thing we read about as having occurred in China. The mountain section of the South is the most fertile section of the South; but after the forests have been taken away, it is absolutely useless, the most useless section of the South.

These forest lands are worth every dollar that they have cost the Government and more; much more. Every acre that has been purchased by the National Government could now be sold for more than

[illegible] way, the reservoirs [illegible] of the streams then [illegible]

A [illegible] could perform no greater s[illegible] question and so manag[illegible] supply of water which the [illegible] that the States should take [illegible] the forests, and the State of [illegible] gentlemen, as you know, the s[illegible] State has are limited. Our tax is by direct [illegible] that they pay all the taxes to the [illegible] they should pay and they complain of th[illegible] taxes [illegible] The Federal Government [illegible] that gets the great bulk of the revenue a[illegible] gets the credit for raising what revenue [illegible] The States are not in a position t[illegible] care of this question and it is really not a State question. [illegible] some of the headwaters of the Mississippi are in our mountain[illegible] the preservation and treatment of our mountains affect every [illegible] through which the Mississippi passes and helps to increase the [illegible] of the Mississippi and the Roanoke and every river.

It is a paying proposition, looked at from the economic stand[illegible] it is a paying proposition to buy these lands, and certainly, as a[illegible] part or a considerable part of the appropriation has lapsed, it [illegible] to be continued and ought to be continued now, because these [illegible] are rising in value every day. If they had all been purchased [illegible] the Weeks law was adopted they could have been purchased [illegible] great deal lower price. Mr. George Vanderbilt, when he ca[illegible] our country, bought 100,000 acres of land, I think, for somethin[illegible] $1.50 or $2 or $3 an acre. Mrs. Vanderbilt sold some tim[illegible] about 80,000 acres of that land to the Federal Government, I [illegible] at something like $5 an acre after she had sold the timber on i[illegible]

hey will take away every sapling and grind it up to make pulp in rder to make paper. They mow it down like a wheat field, and here is nothing left, and then the fire comes and destroys the possi-lity of life.

It is a tragedy, it is a national tragedy, it is a human tragedy to e the forests of the Appalachian Mountains destroyed as they are estroyed and their magnificence and beauty and their utility for umanity and the whole country—I say it is a national tragedy, a uman tragedy to see it swept away for the temporary commercial ses to which they are now put. [Applause.] And the only way stop it, the only practical way to stop it is for the Federal Govern-ent to stop it, because I do not see how the States would have the evenues to stop it.

I induced the last General Assembly of North Carolina, after all the ossible influence that I could bring to bear on the general assembly, appropriate $20,000 to preserve the highest mountain east of the ississippi River, Mitchels Peak. The State government did appro-riate $20,000 to preserve that one mountain, and it was the first ing that was ever done of like kind by our State and, so far as I now, by any State—the appropriation of this amount of money, as me said, to protect the beauty of one mountain. But we did pro-ct it and we have that mountain now, to-day, surrounded as it is y the national forests. You can go there and see now the difference the forests that are under the protection of the Federal Government nd the forests that are not under the protection of the Federal Gov-rnment. Why, the line is as clearly marked as is the line between he Valley of the Nile and the Lybian Desert. One is a barren waste; he other is a scene of magnificent fertility and growth and beauty nd grandeur.

Mr. Chairman and gentlemen of this committee, the time for this overnment to act is now. To-morrow will be too late; to-morrow he ruin will be everlastingly done. We appeal to you as the repre-ntatives of the people who have in charge these great interests ffecting all the people of the country—from New England to the ulf of Mexico—to act and to act now, because this is the only possi-le time in which we can act.

On behalf of all the gentlemen here present I thank you, Mr. Chair-an and gentlemen, for the hearing that you have given us. [Ap-lause.]

Mr. CANDLER. This has been a very interesting hearing, and in ehalf of each member of the committee I desire to express to one nd all of the speakers our sincere thanks. We have enjoyed the earing and it has been a pleasure to have granted you as much time s it was possible for us to give.

(Thereupon, at 12.30 o'clock p. m., the committee took a recess ntil 3 o'clock p. m.)

APPENDIX A.

[illegible] the following documents sent to the [illegible] as part of the record of to-day's proceed-[illegible]

[illegible] STATES TO ATTEND THE HEARING BEFORE [illegible] UNITED STATES HOUSE OF REPRESEN-[illegible] JAN. 28, 1916.

[illegible] COLUMBIA.

[illegible] Charles Lathrop Pack, president; [illegible] S. Ames, director.

[illegible] by Dr Clarence J. Owens and John H. [illegible]

[illegible] CONNECTICUT.

[illegible] Walter O. Filley, State forester. New [illegible] New Haven, Connecticut Forestry Association; [illegible] New England Chamber of Commerce.

MASSACHUSETTS.

[illegible] Harold Parker, chairman, Massachu-[illegible] George F. Swain, Cambridge; Herbert [illegible]

[illegible] Society for the Protection of New Hampshire [illegible] Massachusetts Forestry Association and Society for the [illegible] Harvey N. Shepard, Boston, the Appalachian [illegible]

NEW HAMPSHIRE.

[illegible] Andrew Felker, Commissioner of Agri-[illegible] secretary, Society for Protection of New Hampshire [illegible] of New Hampshire, Peterboro; E. C. [illegible]

[illegible] First, State forester, representing the New Hampshire [illegible] and the New Hampshire State Board of Trade.

NORTH CAROLINA.

[illegible] appointed by the governor: Dr. C. P. Ambler, Asheville; W. H. Plummer, director, Asheville Board of Trade; George S. Powell, Asheville; Dr. Joseph Hyde Pratt, Chapel Hill; A. E. Tate, High Point; Fred Tate, High Point; C. C. Smoot, North Wilkesboro; Hugh MacRae, Wilmington; H. E. Fries, Winston-Salem.

[illegible] Hon. Locke Craig, governor, representing the State; Julius C. Martin, Asheville Board of Trade; Mr. DeBlanc, Agricultural and Commercial Associations, Biedsville, N. C.; J. W. Haynes, Buncombe County; D. Hiden Ramsey, Asheville; George S. Powell, Appalachian Park Association, Asheville; J. C. Smoot, North Carolina Forestry Association, North Wilkesboro.

PENNSYLVANIA.

General delegate: I. C. Williams, Harrisburg, deputy commissioner of forestry.

TENNESSEE.

General delegate, W. M. Goodman, Knoxville, Knoxville Board of Commerce.

VERMONT.

[illegible] nted by the governor: Porter H. Dale, also representing the Greater [illegible] n.

among others present were Senator John W. Weeks, of Massachusetts; Mr. George s Smith, Director of the United States Geological Survey; Mr. Henry S. Graves, ef Forester of the United States; Mr. Albert F. Potter, Associate Forester; Mr. Conville, of the law office of the Forest Service; and Mr. William L. Hall, in charge Weeks law operation.

SAVANNAH BOARD OF TRADE,
Savannah, Ga., January 25, 1916.

A. F. LEVER,
Chairman Agricultural Committee, House of Representatives.

DEAR SIR: I beg to attach hereto preambles and resolutions passed by this asso- ion in the matter of securing an extension of the appropriation to continue the chase of Federal forest reserves in New England and the southern Appalachians ler the provisions of the Weeks law.

Very truly, yours,

THOMAS PURSE, *Secretary.*

AMBLES AND RESOLUTIONS ADOPTED BY SAVANNAH BOARD OF TRADE JANUARY 22, 1916.

ereas with the exception of about $500.000, the appropriation of $8,000,000 made vailable under the Weeks law of 1911 has been used in the purchase of lands in he southern Appalachian and White Mountains for the purpose provided for in aid Weeks law; and,

ereas it is generally recognized that these lands have been economically pur- hased and wisely administered so far as the present conditions as to areas and ontiguousness will permit; and,

ereas it is in the interest of public benefits and economy that these purchases e continued until the work so well begun by the National Forest Reservation ommission is completed: Now therefore be it

esolved by the board of directors of the Savannah Board of Trade, That the United tes Senators from this State and the Representative from this congressional dis- t be urged to use their efforts in securing from Congress an appropriation of $10,- ,000, at the current rate of $2,000,000 a year until 1920, for the purchase of addi- ial lands under the Weeks law.

. true copy.

THOMAS PURSE, *Secretary.*

ASSOCIATION OF EASTERN FORESTERS,
Trenton, N. J., January 24, 1916.

n. A. F. LEVER,
House of Representatives, Washington.

IR: I am directed to submit the following to the Committee on Agriculture:

The Association of Eastern Foresters, representing the State foresters and other fessional foresters from Maine to Maryland, assembled in Boston, January 19, 1916, pectfully urge upon Congress the reenactment of the Weeks law (act of Mar. 1, 1, 36 Stat., 691).

We feel that the fire protective provisions of the law have been so fully justified t we earnestly urge upon Members of Congress the establishment of this fire pro- tion work on a permanent basis.

Furthermore, we have had opportunity to observe the purchases made under this in seven States during the past five years and believe that they have been made iestly and skillfully.

We realize as few other can the tremendous importance of this law to our navigable ers.

For your fuller information, it may be observed that the 32 members of this asso- tion represent the chief official and educational interests in forestry outside the leral service. The members present at the Boston meeting and who joined in s appeal are:

W. O. Filley, State forester, Connecticut.
. E. Moss, assistant State forester, Connecticut.
I. H. Chapman, professor, Yale Forest School, Connecticut.
. C. Hawley, professor, Yale Forest School, Connecticut.

[illegible] Forestry, University of Maine, Maine
[illegible] Maryland
[illegible] Massachusetts
[illegible] Massachusetts.
[illegible] Forest School, Massachusetts
[illegible] Agricultural College, Massachusetts
[illegible]

NEW HAMPSHIRE FEDERATION OF WOMEN'S CLUBS,
East Derry, N. H., January 21, 1916.

n. ASBURY F. LEVER,
Chairman of the House Committee on Agriculture,
Washington, D. C.

EAR SIR: The State Federation of Women's Clubs in New Hampshire has taken at interest in the extension of the Weeks Act for protecting the forests at the head- ers of navigable streams. It took an active part in urging upon Congress the passage he original bill and has followed the purchases from time to time with discriminating approving interest.

hese purchases steady the timber supply and all products dependent upon it and steady the vast industries dependent upon water power.

y careful measurement on the part of the United States Geological Survey, the er-carrying capacity of White Mountain soils when protected by the forests has n proven to affect the navigability of our New England rivers.

s a representative of 8,000 New Hampshire club women, may I urge the members our committee to approve this legislation, in order that the purchases as planned in original act may be carried forward.

Very respectfully,

ANNIE B. SHEPARD, *President.*

NORTH CAROLINA PINE ASSOCIATION,
Norfolk, Va., January 25, 1916.

n. A. S. LEVER,
hairman Agricultural Committee,
House of Representatives.

EAR SIR: We understand that Friday, January 28, has been appointed by your mittee for the hearing of those parties interested in securing a continuation of work under the Weeks law. Our association is composed of lumber manufac- rs in the States of Virginia and the Carolinas and we are very much interested having this work continued. Owing to conflicting meetings and engagements ems impossible for us to have a delegation attend your hearing. We are, therefore, ing this means of conveying to your committee our request that an appropriation included in the agricultural appropriation bill for continuing the valuable work templated under the Weeks law. Much has already been accomplished, but a at deal remains to be done. Hoping for your favorable consideration, beg to ain,

Yours, truly,

W. B. ROPER, *Secretary-Treasurer.*

FALL RIVER, MASS., *January 28, 1916.*

n. JNO. W. WEEKS,
United States Senate, Washington, D. C.

he Fall River (Mass.) Chamber of Commerce indorses the appropriation con- ed in the amendment to the agricultural appropriation bill for the purchase of eral forest reserves in New England and the Appalachians under the Weeks law.

WILLIAM A. HART,
Secretary Fall River Chamber of Commerce.

NEW JERSEY DEPARTMENT OF
CONSERVATION AND DEVELOPMENT,
Trenton, January 25, 1916.

n. WILLIAM HUGHES,
United States Senate, Washington.

EAR SIR: For five years past New Jersey has cooperated with the Federal Forest vice in the effort to control forest fires in the northern part of the State under the visions of the so-called Weeks law. I am informed that the Committee on Agri- ture of the House of Representatives will give a hearing on January 28 to those who interested in the continuance of this act.

lew Jersey can not claim direct interest in the land purchase feature of the law, the help given us in the fire service has been positive and great. It has enabled

[illegible] and I to prove [illegible]

[illegible] in passing from year to year the [illegible] was [illegible] organization for the prevention [illegible] I should be unfortunate, [illegible] by suggesting a want of [illegible] I trust [illegible] effort that you are [illegible] to make toward [illegible] such a measure.

[illegible]

Very truly, yours,

ALFRED [illegible]

NEW YORK, N. Y., *January 27, 1916.*

Hon. [illegible],
[illegible] on *Agriculture*
House of Representatives.

The Merchants' Association of New York took an active part in obtaining the passage of the Weeks law under which the Federal Government has acquired [illegible] land in the White and Southern Appalachian Mountains. The purpose of this law is the conservation of the timber supply of the country, and to [illegible] the forests in the regions named will influence [illegible] of water flow in the streams, thereby affecting manufacturing interests, particularly in the New England States, as well as the towns and cities in the drainage area of the two mountain systems mentioned, from annually recurring floods of increasing volume. Massachusetts, under the Weeks law, has been built up a well-organized and thoroughly [illegible] and has successfully carried on the work provided and wisely [illegible] previous appropriations. If no appropriation is now made the [illegible] will be disintegrated. Experience, we think, has shown that [illegible] and that the full have been justified, and we are of the opinion that [illegible] should be made to carry on the work. This association therefore [illegible] favorable consideration of the proposed legislation extending the provisions of the present Weeks Act and making the necessary appropriations therefore.

MERCHANTS' ASSOCIATION OF NEW YORK,
WILLIAM FELLOW AND MORGAN, *President.*

NEW YORK CONSERVATION COMMISSION,
Albany, January 25, 1916.

Hon. [illegible],
[illegible]
House of Representatives.

[illegible] of the hearing [illegible] for purchase of land and cooperative fire protection [illegible] as originally provided by the Weeks law. [illegible] that it will be impossible for me to be represented [illegible] such is the case I wish to record my sentiments [illegible] consideration by your committee.

[illegible] made by the Federal Government under the Weeks law. New York State we feel that this work has been of great benefit [illegible] and to adjacent States.

[illegible] with New York State for five years in the [illegible] streams. We feel that [illegible] under this agreement have been very great, and we feel that the success of this work in the near future is being placed on a more secure basis. While [illegible] the signal [illegible] the work in the near future [illegible] to cooperate [illegible] with the State on the basis [illegible] we feel that the [illegible] the benefits to be [illegible] from the cooperation [illegible] that the very nature of the benefits to be derived from the cooperation [illegible] affecting as they do several States [illegible] make it necessary that the policy be made a matter of [illegible] strongly that the present law, providing substantially [illegible] Weeks law, receive the favorable recommendation of your committee.

Very truly yours,

GEO. D. PRATT, *Commissioner.*

APPENDIX B.

TONNAGE AND OTHER DATA FOR RIVERS WHOSE WATERSHEDS ARE AFFECTED BY PURCHASES UNDER THE WEEKS LAW.

TENNESSEE RIVER.

(The following purchase areas are entirely or partially on the watershed of the Tennessee River: Smoky Mountain, Nantahala, Cherokee, Mount Mitchell, White Top, Unaka, Pisgah.)

Navigable length, main stream and tributaries, about 1,300 miles for steamboats and about 1,000 miles more for rafts and flat boats.

The river is navigable the year round from Riverton, Ala., to the mouth, a distance of 226 miles. Channel is 3 to 5 feet deep.

From Riverton to Chattanooga the channel is usually 3 to 5 feet deep, a distance of 238 miles. From Chattanooga to the head of navigation, a distance of 188 miles, the channel is less than 3 feet. (Rept. Inland Waterways Com., 1908.)

Traffic movements.

	Tons.	Value.		Tons.	Value.
1914	967,528	$21,120,489	1907	1,507,386	$25,319,040
1913	1,142,671	22,704,161	1906	1,665,284	24,520,608
1912	1,164,796	22,873,691	1905	1,325,812	27,231,142
1910	1,012,670	20,418,930	1904	1,607,463	30,102,299
1909	1,034,750	21,362,190	1903	.....	.....
1908	1,376,386	21,939,800			

This freight was made up of logs, ties, timber (about 50 per cent), iron, sand, gravel, coal, merchandise, etc. (Chief Engineer's Rept., U. S. Army.)

Expenditures.—Appropriations by the United States for navigation improvements from 1790 to 1915 amounted to $9,853,157, of which $1,172,865 was for care and operation. Expenditures were for dredging sands, dams, etc.

Area of watershed, 39,000 square miles. Nonagricultural and mountainous lands in watershed, 2,489,000 acres. (H. Rept. No. 2027.)

Importance to power development.—Prospects for power in the highland portions of area are enormous, minimum indicated low water flow horsepower, developed by this stream and tributaries, 1,210,000. The probable development would be far greater, by storage reservoirs could be increased ten to twelve times.

Power available.—Horsepower, minimum, 1,210,000; assumed maximum, 1,950,000.

Power used.—Wheels, 3,213; horsepower, 221,559.

(Rept. National Conservation Com., 1909, pp. 153–168.)

CHATTAHOOCHEE RIVER.

(A portion of the Georgia purchase area is on the watershed of this river.)

Navigable length, 223 miles from mouth at Chattahoochee, Fla., to Columbus, Ga., channel is 4 feet or more.

Traffic movements.—The commerce of the Chattahoochee is so intimately connected with that of the rest of the Appalachicola that it is impossible to separate it. Thus the figures given below are for the entire Appalachicola River system of the two tributaries, of which the Chattahoochee is the more important.

	Tons.	Value.		Tons.	Value.
1914	93,442	$10,103,756	1906	120,900	$13,510,750
1913	107,238	11,951,481	1905	95,308	8,008,300
1912	100,122	11,742,547	1904	117,757	10,657,000
1910	126,224	16,889,600	1903	107,300	10,480,000
1909	121,190	10,122,564	1902	140,976	12,687,000
1908	121,717	12,000,000	1901	120,738	11,560,000
1907	115,839	10,000,000			

[illegible] ... [illegible] ... [illegible] ... [

ALABAMA RIVER.

(The Georgia purchase area is situated on the headwaters of this river.)
Navigable length, 312 miles from mouth to confluence of Coosa and Tallapoosa ivers. Channel 3 to 5 feet deep. Coosa is navigable for 11 miles from mouth to 'etumpka, Ala. Channel 3 feet or less deep and for 180 miles from Dam No. 4 (about miles below Greenport, Ala.) to Rome, Ga., channel is 2 feet. This river is naviga- e for a slack-water section of 25 miles from Lock No. 4 to Greenport, Ala. Channel feet deep. This gives for the main stream and the Coosa a total of 535 miles of avigable length.
Traffic movements consist mainly of cotton, cotton seed, fertilizer, grain, lumber, aval stores, and general merchandise.

	Alabama River proper		Coosa River, Rome, Ga., to East Tennessee.	
	Tons.	Value.	Tons.	Value.
14	112,345	$4,329,007	28,751	$1,517,978
13	153,295	6,141,808	46,339	1,642,987
12	139,846	7,195,848	52,342	1,349,422
10	.....	6,610,275	88,228	812,608
09	.....	6,043,140	119,072	827,204
08	.....	9,000,000	24,189	2,500,000
07	341 628	3,886,565	8,511	854,000
06	417,041	10,833,488	124,078	3,500,000
05	130,000	13,000,000	82,720	2,789,433
04	127,250	12,907,500	.....	.....
03	133,092	13,317,000	.....	.....
02	145,448	13,680,000	.....	.....
01	114,087	8,060,000	.....	.....

Expenditures.—Total by United States to June 30, 1915, on the entire system of the labama, in main stream and the Coosa, $2,417,897, spent for removing snags, sunken gs, overhanging trees, and shoals, deepening and widening channel, building locks, anals, and dams.
Drainage area, 15,000 square miles. In the drainage basin of the Coosa, the most mportant tributary of the Alabama, there are 767,000 acres of nonagricultural and ountainous land. The total for the entire basin would be a great deal more. (H. ept. 2027.)
Power importance.—Wheels in use, 1,263; 47,761 horsepower developed; available inimum, 275,000; maximum, 487,000 horsepower.

SANTEE RIVER.

(The Boone purchase area and a portion of the Mount Mitchell purchase area are situated on the watershed of this river.)
Navigable length, 250 miles, occasionally for 300 miles.
The main stream from the mouth to the union of Wateree and Congaree Rivers, a distance of 180 miles, the channel is 3 to 5 feet deep.
Wateree River is navigable from mouth to Camden, a distance of about 40 miles, channel 3 to 5 feet deep.
Congaree River is navigable from mouth to Columbia, a distance of about 20 miles, channel about 3 to 5 feet deep. (Progress of Stream Measurements, 1903, U. S. Geological Survey.)

Traffic movements.

	Tons.	Value.		Tons.	Value.
1901	204 375	$1,809,000	1908	70,590	$1,172,169
1902	215,600	1,882,500	1909	119,369	731,730
1903	222,900	1,840,000	1910	81,055	1,717,961
1904	242,800	1,662,500	1912	95,281	520,936
1905	329,350	1,485,000	1913	73,577	749,747
1906	427,300	1,830,000	1914	55,622	1,004,615
1907	474,750	1,735,000			

[illegible] timber, some merchantable [illegible]

[illegible] $[illegible] has been expended on the [illegible] which $65,000 was spent [illegible] more. Work was [illegible] Capt. Chief Engineer [illegible] The greater portion of the [illegible] About 65 per cent [illegible] watershed is [illegible] Falls of the Cahaw[illegible] largest in the Southern [illegible] power, [illegible] maximum, [illegible] [illegible]

[illegible] of the Shenandoah [illegible] Richmond, Va. Depth [illegible] river and tributaries [illegible]

	Tons	Value
[illegible]	527,515	[illegible]
[illegible]	644,742	[illegible]
[illegible]	524,457	[illegible]
[illegible]	648,184	[illegible]
[illegible]	549,310	[illegible]
[illegible]	652,451	[illegible]

[illegible] supplies, fertilizer material, coal, oil, [illegible] $8,199,092. Total estimated for [illegible] Widening and deepening [illegible] Navigation [illegible] and mountainous land in [illegible] Available water power. [illegible]

MONONGAHELA RIVER

[illegible] this river.

[illegible] Fairmont, W. Va. Depth at low [illegible] by the Fairmont. The slack-[illegible]

[illegible]

	Tons	Value		Tons	Value
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				

Consists of coal, sand, gravel, stone, lumber, and packet freight.
Expenditures up to June 30, 1915, $7,920,773, includes purchase money of $3,761,615.
Drainage area, 7,350 square miles; nonagricultural and mountainous lands in watershed, 987,000 acres.
Developed water power.—Wheels, 129; horsepower, 2,329. Available water power, minimum, 71,000 horsepower; assumed maximum, 283,000 horsepower.

POTOMAC RIVER (INCLUDING ANACOSTIA).

(The Potomac and Massanutten purchase areas and a portion of the Shenandoah area are located on the watershed of the Potomac River.)
Navigable length, 113 miles from mouth to Washington, D. C. Channel 18 feet deep at low water. Navigation ends at Little Falls, 3½ miles above Georgetown. The Shenandoah, tributary to the Potomac, is navigable for 200 miles.)

Traffic movements.

	Tons.	Value.		Tons.	Value.
1901	[1] 1,000,000		1908	1,442,000	$21,093,900
1902	[1] 1,000,000		1909	1,430,788	31,272,050
1903	1,350,000		1910	1,701,490	35,192,127
1904	1,340,000		1912	1,188,689	35,329,939
1905	1,476,500		1913	1,349,509	37,158,026
1906	1,284,000	$20,116,052	1914	1,319,046	35,847,170
1907	1,442,900	21,093,900			

[1] Estimated.

Consists of coal, ice, lumber, wood, sand, gravel, clay, stone, oil, asphalt, general merchandise, fish, canned goods, etc.
Expenditures up to June 30, 1915, $3,462,966 for deepening, straightening and widening channel.
Area of watershed, 14,500 square miles. Nonagricultural and mountainous lands in watershed, 2,095,000 acres. (H. Rept. 2027, p. 16.)
Developed water power.—Wheels, 1,067; horsepower, 29,390. Available water power, minimum, 176,000 horsepower; assumed maximum, 462,000 horsepower.
(Rept. National Conservation Com., 1909, p. 150.)

CONNECTICUT RIVER.

(White Mountain purchase area is partially on the watershed of this river).
Navigable length, 50 miles. From Hartford, Conn., to Holyoke, Mass., 34 miles. Channel is 3 to 5 feet deep. The reamining 16 miles of navigable length is of little importance; channel 3 feet or less in depth.

Traffic movements.

	Tons.	Value.		Tons.	Value.
1914	559,728	$35,193,842	1906	440,024	$11,531,040
1913	644,633	38,843,681	1905	673,383	.....
1912	619,445	39,443,282	1904	675,000	.....
1910	636,874	22,689,942	1903	681,000	.....
1909	614,780	27,162,727	1902	700,000	.....
1908	515,581	14,001,989	1901	723,187	.....
1907	485,704	12,349,420			

Made up largely of coal, lumber, building material, and general merchandise.
Expenditures up to June 30, 1915, something over $848,905 by United States for dikes, canals, dams, locks.
Area of watershed, 11,085 square miles. Nonagricultural and mountainous lands in need of protection, of first importance, 429,000 acres. (H. Rept. 2027, p. 17.)
Importance of power.—Developed water power: Wheels, 3,110; horsepower, 292,899. Available water power, maximum, 491,000 horsepower.
(Rept. National Conservation Com., 1909.)

MERRIMAC RIVER.

The White Mountain purchase area is partially on the watershed of this river.
Navigable length, 17½ miles from mouth to Eastern Channel. [illegible] feet wide and deep.

Traffic movements.

Tons.	Value.		Tons.	Tons.
[illegible]	[illegible]	1909	..	12,[illegible]	.....
[illegible]	[illegible]	1909	.....	67,121	.....
[illegible]	[illegible]	1910	.....	42,[illegible]	[illegible]
[illegible]	[illegible]	1912	.. ..	8,[illegible]	[illegible]
[illegible]	[illegible]	1913	..	46,[illegible]	[illegible]
[illegible]	[illegible]	1914	..	8,[illegible]	[illegible]
[illegible]					

Freight is chiefly coal and lumber.
Expenditures by United States up to June 30, 1915, $[illegible] for removal of wreckage from and [illegible] deepening and widening channel.
Drainage area, [illegible] square miles. Nonagricultural and mountainous areas in need of proper flow of first importance, 261,000 acres. (H. Rept. 2027, p. 17.)
Power resources: Power used, 1,166 wheels, 161,223 horsepower. Power available for proper regimen, maximum, 190,000.
(Dept. of National Conservation Com., 1909, pp. 150, 157.

SACO RIVER.

The White Mountain purchase area is partially on the watershed of this river.
Navigable length, [illegible] miles from mouth to Saco and Biddeford. Low water depth, 9 feet.

Traffic movements (mostly coal and building materials).

Tons.	Value.		Tons.	Tons.
[illegible]	[illegible]	1908	.....	44,[illegible]	[illegible]
[illegible]	[illegible]	1909	.....	50,[illegible]	[illegible]
[illegible]	[illegible]	1910	.....	47,[illegible]	[illegible]
[illegible]	[illegible]	1911	.....	.....	.....
[illegible]	[illegible]	1912	.....	111,[illegible]	[illegible]
[illegible]	[illegible]	1913	.....	68,[illegible]	[illegible]
[illegible]	[illegible]	1914	.....	64,231	[illegible]

(All coal.)

Expenditures up to June 30, 1915, by United States, $398,586, for piers, jetties, [illegible] and improved channel.
Drainage area, [illegible] square miles. Nonagricultural and mountain land in need of proper flow of first importance, 332,000 acres. (H. Rept. 2027, p. 17.)
Power resources: Power developed, used, Wheels, 237; horsepower, 25,332. Power available, maximum assumed, 69,000.
(Dept. National Conservation Com., pp. 150, 165.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Monday, January 31, 1916.

AFTER RECESS.

The committee reconvened at 3 o'clock p. m., pursuant to the taking of recess.

STATEMENT OF DR. C. L. ALSBERG, CHIEF OF THE BUREAU OF CHEMISTRY.

The CHAIRMAN. We will now take up the Bureau of Chemistry, on page 115 of the Book of Estimates and on page 241 of the program book.

We will ask Dr. Alsberg, chief of the bureau, to take charge of the statement from that bureau.

Doctor, we have been taking up these various lines of work item by item and asking for a brief statement on each of them. We have been trying to follow, so far as we can, the project book in the order in which the items appear. However, first of all, we will take up your statutory roll. I see there is no change in your statutory roll until we get to item 9, on page 116, where you have an increase of three clerks by transfer from lump fund for food and drugs. May I ask if the lump fund has been reduced to that extent?

Dr. ALSBERG. Yes, sir; in the customary way.

The CHAIRMAN. And the transfers have been made because these people, I presume, have become permanent employees?

Dr. ALSBERG. Yes; and I may say, in connection with the increase that has been made in the number of clerks, that this was a weak spot in the administration of the bureau with reference to the food and drugs act. There has been considerable delay before violations were reported to the Department of Justice. We have not managed ever in the work on the cases to report them to the Department of Justice as promptly as desired. I am convinced that one of the reasons was that there was a disproportion between the clerical force and the chemists and inspectors. The chemists and inspectors, in other words, fed the work to the administrative part of the bureau faster than the clerical staff could prepare the cases for report to the Department of Justice. The main reason for the increase in the number of clerks is to facilitate that work, and thus to prevent delay in enforcing the law.

The CHAIRMAN. There is really no increase in the number of clerks you have asked for; simply that they are to be paid out of another fund?

xecutive ability of a high order and a thorough knowledge of the od industry.

Mr. HAWLEY. Is the position in New York worth $2,250, even if not lled by this man?

Dr. ALSBERG. I think entirely so. He has charge of the food and ug inspectors and he has all of the supervision of the collecting of mples and the securing of evidence other than chemical evidence.

Mr. HAWLEY. If he should go out of the service, you think the man ho succeeded him should have $2,250?

Dr. ALSBERG. I think that is a very small salary for the responsi- lities of the office.

The CHAIRMAN. Take up item No. 18, a decrease of one by change one food-and-drug inspector at $2,250. That is covered by the xplanation just given?

Dr. ALSBERG. That is what we have just been discussing.

The CHAIRMAN. Your next change is in item 22, increase of two od-and-drug inspectors, at $1,400 each, by transfer from lump fund r food and drugs. The explanation is the same as for item 9, is not?

Dr. ALSBERG. That simply means we thought it good administra- on to increase the number of food-and-drug inspectors so as to cover ie country. We have none too many; only 47 in all to cover the ntire United States. These two are at work now. This is simply transfer from the lump-sum fund, and that fund has been dimin- shed proportionately.

The CHAIRMAN. What is your explanation for item 23—the same s item 22? It says "One assistant by transfer."

Dr. ALSBERG. Yes; that is the same as item 22. This man does eneral inspection work and is attached to my office in Washington nstead of being attached to one of the laboratories in the field. here are a good many investigations which have to be made in onnection with the food-and-drugs act which are better made by a an who reports directly to me than by a man who is located outside f Washington.

The CHAIRMAN. Your next change is in item 31, page 117 of the ook of Estimates, increase of one laboratory helper, messenger boy, r laborer, by transfer from lump fund for citrus by-products.

Dr. ALSBERG. We have located in California a small-scale labora- ory at work on the utilization of citrus by-products, as I will explain hen we come to that item. This is simply to furnish some of the echanical help that is necessary in doing that work.

The CHAIRMAN. And you have reduced the lump fund?

Dr. ALSBERG. Yes, sir.

The CHAIRMAN. Item 38, one mechanic by transfer from lump fund r food and drugs. That is the same as item 9, is it not?

Dr. ALSBERG. The same. All of these are the same. The lump und has been correspondingly reduced in each case.

The CHAIRMAN. Item 39 is the same?

Dr. ALSBERG. Yes, sir.

The CHAIRMAN. Item 40 is the same?

Dr. ALSBERG. Yes, sir.

The CHAIRMAN. Item 41 is the same.

Dr. ALSBERG. Yes, and 42.

The CHAIRMAN. Item 42, one mechanic—the same?

Mr. [illegible]. Yes, sir.

The CHAIRMAN. Why was he carried on the lump fund before [illegible]?

Mr. [illegible]. We had no statutory place for him, and we wanted [illegible].

The CHAIRMAN. I notice you have an increase of three messengers [illegible] each, by transfer from the lump fund.

Mr. [illegible]. That is the same explanation as in the case of item [illegible]. We [illegible] manual labor and we appointed the men [illegible] to the lump-fund sum; and it is our purpose [illegible] to the statutory roll.

Mr. HAWLEY. How many employees were added to your bureau [illegible] the lump fund who are now to be transferred [illegible]?

Mr. [illegible]. I could not give you that without going over the [illegible]. Those that are set out here are not set out here. Those that are set [illegible] excepting the chemists. There are 25 [illegible] to the statutory roll.

Mr. [illegible]. [illegible] to the statutory roll. There are 25 [illegible] a year ago?

Mr. [illegible].

The CHAIRMAN. [illegible] two student assistants, at $600 [illegible]. What [illegible]?

Mr. [illegible]. [illegible] assists in running the photostat, which [illegible] copying of letters. The copying of letters [illegible] can be done more cheaply by photo[illegible] typewriter. The other one [illegible].

The CHAIRMAN. [illegible]?

Mr. [illegible]. [illegible] they are doing the service [illegible] would because they are [illegible].

The CHAIRMAN. [illegible] have 22 messengers or laborers here. [illegible] messengers and how many laborers? That [illegible].

Mr. [illegible]. [illegible], 32, and 33. There is a [illegible] which [illegible] are laborers, and the [illegible].

[illegible] as to permit the bureau to [illegible] messengers [illegible] as the work may re[illegible]. Sometimes one, sometimes the other, can [illegible].

The CHAIRMAN. [illegible] at $2 each.

Mr. [illegible].

The CHAIRMAN. What room is necessary, I presume?

Mr. [illegible]. I know the building about.

The CHAIRMAN. Then we ought [illegible] and take up your first item [illegible]. For conducting the investigations [illegible], relating to the application [illegible] I would like you as briefly and as [illegible] as you can to tell us what you do under that act.

Mr. [illegible]. [illegible] and the various investigations that might be grouped under agriculture, chemistry, and investigations that are carried on in cooperation with the Bureau of Plant

Industry, dealing with the growth of plants and the effect of soil, climate, and fertilizers on crops. The chemical side is done by our bureau and the physiological side is done by the Bureau of Plant Industry.

There are included also certain other investigations on such questions as milling and different investigations on malting, investigations on leather and tanning, certain investigations on paper, on wood distillations, on rosin and turpentine; also investigations on the production of sugar, sirups, and starches, and on the utilization of the various fruit and vegetable wastes and by-products such as cattle feeds and the like. In other words, roughly, this covers what might be called investigations in agricultural technology. You see, there is an immense amount of work that has to be done by the department on the commercial utilization of agricultural products and on the production of crops, from the chemical standpoint.

In general, that covers the scope of these investigations. With the sum which is at the disposal of the bureau for these investigations, they are not as extensive as I could wish and as I think is desirable.

The CHAIRMAN. Would you like any of your assistants who have charge of these particular lines of work to make statements to the committee? We would be very glad to hear them, if you desire.

Dr. ALSBERG. If the committee desires. I do not know in what amount of detail the committee wishes to go into these individual projects.

The CHAIRMAN. If they could be covered rather briefly.

Dr. ALSBERG. I think I can perhaps answer pretty nearly what the committee wishes, if I may call on my assistants in case I can not give you the information.

The CHAIRMAN. Are there any questions on that item, gentlemen? If not, take up item 54.

Dr. ALSBERG. These are investigations which are conducted in collaboration with other departments of the Government and cover a number of small items that are asked for by the various departments.

Two of the large items covered by the investigations are the production ofdistinctive papers, which you will find outlined on page 261 of the book of projects, and the study of cereal-dust explosions.

The study of distinctive paper is an investigation that is desired by several departments of the Government, the Treasury Department particularly, and is for the purpose of assisting the Treasury Department in obtaining the best kind of paper for printing money and postage stamps. We have just been at work in assisting the Treasury Department in making a distinctive watermark which presumably may be of service in printing money, this watermark differing from the ordinary watermark in that it is raised instead of being depressed; that is to say, the paper is less transparent instead of more transparent.

These dust-explosion investigations are done in conjunction with the Bureau of Mines. The problem of dust explosions is very similar to the problem of mine explosions, certain mine explosions being due to explosions of coal dust. In the Pacific Northwest there has been a tremendous loss from the explosions of thrashers. Year before last some 300 thrashers were burned up, at an estimated loss in money of a million or a million and a quarter of dollars. The reason thrashing outfits up there blow up more than elsewhere is that the

[illegible] brought into this investigation, and [illegible] the Bureau of Mines became [illegible] the problem of the explosions of coal dust in [illegible] We have been able to suggest a procedure which, so far [illegible] reduced the explosions greatly. We [illegible] explosions last year that were connected with the use [illegible] of them that any trouble.

[illegible] seems to come from the [illegible] Mr. Ostrander. How about sprinkling the grain before putting it into the machine—dampening it? Would that reduce the amount of gas formed?

Mr. Perley. The experiment station at Washington did some work on that and found that, as I understand, it increased the moisture content to such an extent that it raised the question of damage to the grain.

Dr. Munroe. It is not gas that makes the trouble; it is dust and smut. We have carried out experiments in the laboratory on the explosibility of mixtures of grain dust, and we find they are more explosive to get off easier and develop more pressure when exploded than coal dust does.

You will probably recall that the grain elevator and mill is a very bad fire risk. One of the reasons is there is so much dust around that the mill is likely to blow up or the elevator is likely to blow up, and we are investigating that part of it also. It is evident that anything which increases the cost of handling grain is going to lower the price to the farmer and to increase the price to the consumer. That has to be counted in. So if we can reduce the fire risk and explosion risk in the handling of grain we think it is a valuable thing for the Government to do. Recently there was an explosion in a grain elevator at New York on the West Shore Railroad. One of their elevators exploded at Weehawken, outside of New York, and blew out the whole side of the building, with a resulting damage of some $75,000. It is estimated [illegible] Sometimes there is a considerable loss of life in these exp[illegible] There were recently two explosions in the starch and dex[illegible] ling house of the Corn Products Co., at Edgewater, ruined the plant, killed 3 men, and injured 16 others.

There seems to be the danger of explosion wherever you have combustible dust of any kind whatever. We have looked into this question and find that there are all kinds of industries which have fires and explosions due to the presence of such dust, such as spice mills, cinnamon-bark mills, flour mills, corn mills, grain elevators, starch factories, sugar factories, dextrin plants—almost any plant where there is likely to be an accumulation of dust that is combustible, and almost anywhere in those plants you are likely to have an explosion that causes great financial damage and may cause loss of life.

The CHAIRMAN. How long have you been doing this work?

Dr. ALSBERG. We are in the second year.

The CHAIRMAN. And you are reaching a place now where you think you are beginning to see some daylight?

Dr. ALSBERG. We think we probably have the problem for the crushing machines pretty well solved. I may add, if it interests you, that about three years ago—1913—there was a big explosion in Buffalo. A mill blew up and killed 33 people, and the whole mill burned with a loss of several hundred thousand dollars damage. As a result of that, the New York State Industrial Board started to formulate a series of rules and regulations to prevent similar occurrences. They had no data; it was not known what was the cause of the explosion, but it was known that the Bureau of Mines and the Bureau of Chemistry were cooperating on this question, and they called in our experts. As a result, regulations have been formulated in the State of New York to prevent these occurrences, and other States are adopting those regulations pretty much as they stand. The regulations are based, to a considerable extent, upon the joint recommendations of the Bureau of Mines and the Bureau of Chemistry.

The CHAIRMAN. That is a very interesting statement. Is there anything further on that item, gentlemen? If not, take up the next item, Doctor, on page 119, "For investigating the character of the chemical and physical tests which are applied to American food products in foreign countries," etc.

Dr. ALSBERG. This is not a new item. That is for the purpose of enabling the manufacturer who wishes to export a food or drug product from the United States to a foreign country which requires a certificate from the Government of the country of origin to have his goods examined and to receive such a certificate. It is routine work. We make these examinations on request, but last year, for the first time, we required the manufacturer who asked for a certificate to pay the actual cost of making the analysis.

The CHAIRMAN. That requirement is to become permanent law, I notice.

Dr. ALSBERG. As I understand it, sir.

The CHAIRMAN. Take up item 56, "For investigating the preparation for market, handling, grading, packing, freezing, drying, storing, transportation, and preservation of poultry and eggs," and so on. You seem to have an increase there, Doctor, of $9,000.

Dr. ALSBERG. That increase is asked for because the present appropriation is not believed by the department to be adequate. The work could not be carried on during the past year on the scale that is desired. There are a number of new lines of work which are of importance to the people. For example, the Food Research Laboratory of the bureau, which has charge of this work, has been trying to

assist [illegible] the small poultry and egg packing [illegible] the small towns. In cooperation with the Office of Public Roads and Rural Engineering plans and specifications for the equipment of inexpensive but efficient small packing plants, with necessary refrigeration and with a poultry fleshing station, are being prepared, and the best methods of packing and shipping poultry in these small houses are being investigated and described.

It has been found possible to equip a small plant for the packing and shipping of carload lots of poultry with a capacity of about 20,000 pounds a week at a cost of something like $10,000 to $15,000 and, as the value of the carload of goods is from $2,000 to $3,000 the amount of the investment on a turnover of $2,000 to $3,000 a week is not very great. The result of better accommodations is that such a plant can ship a better product for less money than can a plant that is not so equipped. We deem it advisable to push this line of work. The work has not been confined to plants of the kind which ship a carload a week, in carload lots, but there has been work also on the development of a smaller plant for the smaller packer who does not ship as much as that, and for his needs there has been devised a large-sized ice box which can be installed for approximately $800. It is capable of chilling the dressed poultry and eggs. These boxes have a capacity of about 15,000 pounds a week, and the upkeep is very small.

Mr. HOWELL. Do you furnish the plans for those packing houses?

Dr. ALSBERG. Yes, we have furnished them. But this work is at a stage where we have not yet published them. The publication, we hope, will soon appear. We have been making the plans and have been in the attitude, practically, of trying them out in the places of individuals who have installed them under our directions. We installed several, for example, for experimental purposes in Indiana, and we found that one small shipper saved as much as $22 on the handling cost of every 20,000 pounds of poultry he shipped, in addition to getting from a cent to a cent and a half a pound more for his poultry and a cent a dozen more for his eggs when they arrived at the markets.

You see the very small shipper's method of shipping poultry at the present time is pretty crude. The birds are first soaked in cold water; then they are put into a barrel with cracked ice and a lot of ice is put on top of them, and of course when the ice melts that water becomes contaminated from the dirt on the feet and on the heads of the birds. As the birds soak in the water the water leaches out of the flesh of the bird some of the flavor and a good deal of the food value, so much so that several hundred pounds of food is leached out of every carload of poultry before it reaches the market. At the same time, the value of the shipment when marketed is several hundred dollars, or as much as three or four hundred dollars, less than if the birds were shipped dry packed. The bird also absorbs some water from the ice, for which the consumer pays chicken prices.

Mr. HAWLEY. We ought to have a moisture-content regulation like we have with grain.

Dr. ALSBERG. The investigations of which I am speaking are to show the [illegible] shipper how to ship his stuff so that a sanitary and profitable [illegible] marketed, for which he gets every cent of its value [illegible] village.

Mr. OVERMYER. And it is probably not any more expensive than ie method he is now using.

Dr. ALSBERG. All the information we have shows that it is less xpensive. These investigations are for the purpose of showing the nall shipper how he can ship the poultry in a sanitary condition.

Mr. OVERMYER. Do you expect to issue a bulletin soon?

Dr. ALSBERG. Yes; we expect to issue a bulletin on that. Does hat cover the shipping part sufficiently?

The CHAIRMAN. I think so.

Dr. ALSBERG. There are several other lines of work under this eem. One line is what we call the fleshing of poultry. The fattenig of poultry for the market is probably at least as profitable, and erhaps a more profitable proposition, than the fattening of a steer. ut, unlike the fattening of a steer, it can not be done—or at least it as not been done—profitably on the farm. Perhaps one reason is hat a bird, being a small animal, if it is left without food and water nd shipped for one or two or three days to a packing house, loses ery much more weight than the steer does.

The bird may fall off as much as half a pound or three-quarters f a pound in being shipped from the farm to the packing house. attening poultry is a profitable business. You can put a pound of eat on a young bird in a week or 10 days. Nobody has ever made, o far as we have been able to learn, the kind of scientific investigaion of the fleshing of poultry that has been made of the fleshing of igs or of steers. Yet it is just as profitable and as necessary an nvestigation as in the case of steers and hogs. So we are carrying n this investigation to find out what is the best and the cheapest ethod of putting a pound of flesh on a chicken which has come to he marketing stage, just the same as investigations have been caried on to find out what is the cheapest way under a given set of onditions of producing a pound of beef. It is a little different roblem in poultry than in the case of steers, because you can ut the fat on the fowl either in among the muscles or around he intestines. If the gain in weight is around the intestines, it is sually a dead loss to the consumer, because the woman usually guts he fowl and throws the fat away. But if you have the fat nicely istributed among the lean of the muscles you have got something hich makes the fowl of a better quality and of greater food value. hat is a well-known condition in the fattening of mutton—whether ou put the fat among the muscles or among the entrails; it is very rgely a question of how you feed the animals. We are at work ow trying to find out what is the best method to pursue in the leshing of poultry. The radical difference between the fleshing of oultry in large amounts for market and the fleshing of other farm nimals is that the poultry is fleshed by the poultry dresser in what s termed a "feeding station," which adjoins his packing house. Here the birds are confined in small, clean cages and carefully watched nd fed for two weeks. They are not permitted to take any exerise, their sole object in life being to be perfectly comfortable and lacid and gain in weight.

There is another set of investigations which deal with the damage o eggs in transit. Am I going at too great a length into these rojects?

The CHAIRMAN. No.

[illegible]

[illegible] It was easier in the beginning to get [illegible] There are fewer [illegible] and they are more easily [illegible] W[illegible] effort will practically eliminate [illegible] But the bulk of the breakage [illegible] per cent comes, it seems to us, from [illegible] carload lots, and it is very desirable that [illegible] educational work to instruct [illegible] loss than carload lots be pushed so as to [illegible] amount of breakage. We have had to curtail [illegible] because of a lack of funds.

It [illegible] committee to know that, while in all probability [illegible] loss from breakage has not resulted materially in lowering the price to the consumer, there is some indication that it has increased the price to the producer.

Probably the reason why it has not made any difference in the price to the consumer is that the egg crop is not enough to supply the demand. Consequently, the producer, more than the consumer, is benefited by any saving that may have been made. Where you have a crop like oranges, in which the supply is greater than the demand, you can expect some benefit to the consumer when you prevent any waste, but where you have a crop like eggs—if I can call eggs a crop—where the demand is always ahead of the supply, there is not a resulting decrease in price to the consumer, though there is an increase in the quality of the product.

Mr. OVERMYER. Whether there are any broken or not?

Dr. ATKINS. Whether there are any broken or not, the producer is chiefly the one who benefits from the elimination of those broken eggs. Of course, the railroads benefit to a certain extent because they do not have to pay the damages on eggs which have been

roken, and thereby lose part of the hauling charges. Theoretically, it is supposed that the damages paid by the railroads for destruction to perishables in transit is adequate to recompense the loss o the producer and shipper. Practically, this is never the case if laims are adjusted on a strictly valuation basis, because the more ow-grade or damaged goods there are on the market to be disposed f the more the price received for the crop in general is lowered; and he general disrepute into which commodities that are constantly he objects of claims against the railroads fall makes for lessened roduction in the long run.

Another line of work that we have been engaged on under this investigation and for which particularly we need more money is what e call our demonstration work. We have connected with this work freight car which is equipped as an egg-candling and an egg-packing stablishment, and may be similarly adapted to poultry dressing and andling. That car is sent around the country to teach the producers how to handle and how to judge eggs and how to put them up n such shape that they will reach the market in a condition to fetch he highest price. The cost of operating that car last year was only 3,000, and it ran from May to September. When I say last year, I ean for the season—not for the fiscal year. Before the car reaches town, through the cooperation of the local authorities and the raiload, there are notices posted, and we find that people of all sorts come own to the car to listen to what our demonstrators have to tell them. ast year the men in the car talked personally with some 6,000 eople, and they visited 83 small towns, mostly in southern Indiana, topping one day in each little town. The car during the summer of 915 has been in various sections in the region between Indianapolis n the north and New Albany on the south. And the people we each in that way are the kind of people we could not reach with ulletins. They are hucksters, little buyers and shippers, and chilren and people who do not read bulletins. Also many teachers nd county agents come for practical help that can not be got out of ulletins. I think it is no exaggeration to say that the quality of the ggs shipped from a section where our car has been has immediately nproved, and I think if you will inquire of the jobbers who receive ggs from such sections that they will tell you they can notice a reat improvement in the quality, and consequently in the price, hat they are able to pay after the passage of that car through any gg-producing region.

The CHAIRMAN. Is it your purpose to put on another car?

Dr. ALSBERG. No; that was not our purpose, but we can cover nore ground and keep the practical demonstration work on both gg and poultry handling going a longer portion of the year. We ant to spend some of this increase on the personal-contact demonstration work and some on the work of developing small precooling lants, that they may be brought to the highest pitch of economy onsistent with the preparation of sanitary products.

The CHAIRMAN. Under your research work you are spending 21,580, or at least you are estimating for that much. I think it ould be very well to say a word about that item. It is on page 52 of the program book.

Dr. ALSBERG. That is the laboratory work. In that connection e can not tell anything about whether a given experiment in the

[illegible] This [illegible] by [illegible] [illegible] [illegible]

a lack of knowledge of transportation needs, a great quantity of at fish arrives at the market in very bad condition. The fishermen wn there know very little about how to ship that kind of a product, d the railroads do not know how to handle it. They are now ipping most of the product in box cars with a layer of fish and a yer of ice and then a layer of fish and a layer of ice, and so on. warm weather the fish arrive at their destination sometimes in a tally unfit condition. The refrigerator car is not used, very largely r the reason that the method of transportation with ice practically sults in ruin of the insulation of the refrigerator car.

In other words, they do not know anything about the best methods transporting fish, and this investigation is for the purpose of ding out what are the best methods of transporting and handling ch fish. When we have that information, it is to be disseminated, that the producer can furnish a proper article and the food supply the country in these important nitrogeneous substances can be reased in quantity and quality.

I can illustrate, for instance, the sort of thing that we are doing citing the shrimp industry, which exists especially in northern rida and Georgia and the Gulf waters. They were shipping shrimp Northern and Western States prior to the enforcement of the food d drugs act preserved with borax, which at the present time is garded as an objectionable practice. The food and drugs act evented them from using borax to preserve their shrimp. The rimp men did not know how to get the product to market with- t borax, so the shrimp industry of that section was practically ined, and the only shrimp to be utilized were the canned shrimp. e have had some men at work during this past year under this propriation for the purpose of trying out the shipment by express d freight of refrigerated shrimp handled in definite ways, and the oblem has been so solved that there is every reason to believe at there will again be established a fresh-shrimp business, and this od which has not been used is now going to be used in a considerable iount. That is just an example of the work that is being begun der this appropriation.

If you would like to hear from Dr. Clark, who is in charge of the rk, he is here.

The CHAIRMAN. Yes, Dr. Clark, let us hear from you briefly on at item.

Mr. OVERMYER. You say refrigerator cars are not suitable for pping fish?

Dr. ALSBERG. They are not using them. The reason they are not ng them at present, at least for the southern business, is that the thod of shipping is to put a layer of ice in the car and then a yer of fish, and then another layer of ice, and so on, or, when the h is barreled, to cover the barrels with ice.

Mr. OVERMYER. Would there be any difference in artificial and tural ice in the matter of the use of the car, do you know?

Dr. ALSBERG. I do not know about that.

Mr. OVERMYER. You said something about injuring the interior the car—the insulation.

Dr. ALSBERG. You see, the refrigerator car is usually insulated th some one of the various insulators on the market. A good sulator is porous and holds the air in the pores, but when it gets

wet, those air pores are filled with water, and consequently it is no longer an insulator. As a result of that, if you wet the insulation of the refrigerator car you practically run it as a refrigerator. That is the point.

Mr. OVERMYER. I thought perhaps dirt in the ice or something of that sort injured the insulation.

Dr. ALSBERG. No, it is the wetting of the insulation. That is the point.

STATEMENT OF DR. E. D. CLARK, INVESTIGATOR IN FISH AND FISH PRODUCTS, BUREAU OF CHEMISTRY.

Dr. CLARK. Which particular line do you wish me to take up?

The CHAIRMAN. I think you had better briefly discuss all the lines you are working on, Doctor. For instance, take up the freezing and the cold storage of fish.

Dr. CLARK. The most striking thing about the fish business to anyone who has looked it up is that fish are not produced uniformly at different periods of the year. Of course, that seems almost a trite thing to say, but the whole thing about the fish industry that makes it uncertain is exactly this one thing, that the man who is handling fish—the producer—does not know what to-morrow will bring, whether he will have one barrel of fish or a hundred. He does not know whether he is going a week without having any fish at all, or whether during the week he will produce more than the market can absorb.

That means one of two things, either the excess production will have to be dumped or sold as fertilizer, which, of course, is a great economic waste, or else it must be preserved in some way and conserved for later use. There are different ways of preserving food. Canning food is a tremendous industry; smoking food is another, such as the smoking of bacon and ham and fish; the salting of foods is another; and there is the curing of foods in all sorts of ways. But, if you will notice, every one of those different methods of preserving foods results in a change in the taste or the flavor.

The only reason you pay $1.50 for a broiled lobster or 25 cents for six or eight oysters is to secure the very delicate sea-food flavor that is in them. That flavor is practically wholly destroyed by canning; and if you preserve by the use of salt or smoke—for instance, kippered herring—you entirely alter the flavor; you have something that has no relation whatever to the flavor of the fresh fish you started with. For that reason, it seems to us, it is desirable to investigate the use of cold storage for fish, because cold storage is the one means that is available to the producer and middleman that enables him to conserve the excess production of fish and to keep it in such a condition that he can market it, fresh, at a reasonable price. If he can not freeze, there is a tremendous waste, and he very often has to sell at destructive prices. For example, there are steam trawlers. The trawler drags the bottom of the ocean off the St. Georges Bank, for example, and off Boston. They catch haddock up there principally and bring it into Boston. If the price of haddock is 5 cents a pound wholesale to-day they will land those haddock and dispose of them in Boston. If their catch of haddock amounts to more than 100,000

unds they will not go to Boston, because that market can not sorb 100,000 pounds of fish at one time. They would then go to rtland, Me., direct to the canning industry up there, and sell their ch at 2 cents a pound, under contract. You see that represents ss to the producer. Or, on the other hand, they will take the to the "splitters," as they say—that is, the fish is split—so they salt it and turn it into finnan haddie, which, however, sells for igh price, and so that is not such a serious matter; but still it in-feres with the continuous supply of fresh fish.

We went to see many different fishermen all over the country in State and another, large and small, representing many different ses of the fish industry, and they agreed that one of the most essary things to be done is to investigate the cold storage of fish—t is, the hard freezing of fish. The process in itself is very simple. consists of freezing the fish in a brine-pipe room with a zero tem-ature or below. After freezing they just dip the fish in a bath of l water, which immediately congeals over the whole fish and so s it in an envelope of ice. In other words, when you freeze and e the fish, you have done pretty nearly all that is necessary to when the fish is canned, but heat has not been used and the flavor not been destroyed.

ome people claim they can detect frozen fish by its taste. It is y doubtful whether the ordinary layman can do so unless it has n in storage for a very long period of time.

he CHAIRMAN. Can you?

r. CLARK. I do not think so. I have had fish in Washington ch I suspected of being frozen fish, but it is almost impossible to . Sometimes its texture is a little drier and the muscle fibers are so soft. But in general it is almost impossible to tell if the pro-t is well handled. Some dealers say they can tell.

he CHAIRMAN. This work has been going on only for a short le, as I understand it—about two years?

r. CLARK. The first fish were put into storage about a year and a ago. In November, 1916—that is, of this year—it will be two rs since this experiment started. We started our experiments by hing fish on the shores of New Jersey, having them brought in mptly, washed, frozen, glazed, and boxed under our own eyes, and ped to Philadelphia, where they were put in our cold-storage ms under commercial conditions.

We are allowing our cold storage fish to remain in cold storage for years, in order to carry the experiment to its logical conclusion; to its commercial conclusion, because everybody in the fish ustry knows that if you freeze bluefish in the summer of 5 there would be no object in carrying those fish to the summer 916, because by that time, in July or August, on the New York re, there will be another catch of bluefish, and, as you have paid carrying charges for a year and paid the insurance charges, you ld not compete with the price of the fresh fish. We are carrying fish twice as long as would be customary under the commercial ditions, with the idea of finding out the full extent of the deteriora-, if there is any.

he CHAIRMAN. Have you carried your investigation far enough ustify you in giving out information to the trade at this time?

[illegible] experimental carload of fish from Jack- [illegible] the Jackson track and, through a special arrangement with [illegible] attached to that car is a special cabin car, or caboose, [illegible] to eat and sleep in, and where they take fre- [illegible] with electric thermometers of the temperatures of [illegible] the top layers of the barrels and the bottom layers of the [illegible] different parts of the car, and the temperature of the [illegible] different locations. The fish are analyzed chemically [illegible] they have had carefully so that we know their condition at the [illegible] and then they will be analyzed again when they are [illegible] New York on Wednesday morning, and if there is any [illegible] we will need to and also what temperature caused it.

[illegible] all these investigations you are making [illegible]

[illegible] to get to the people.

[illegible] and new sea foods.

[illegible] the fish [illegible] shown [illegible] or made [illegible]

fertilizer. Now, there are a great many things that can be made from the different parts of fish. It may be possible, for instance, to utilize the bones of the dogfish, which is a member of the shark family and which has been called the scourge of the Atlantic because that fish consumes food fish. It will plow through a school and bite the fish for no reason whatever. The bluefish does the same thing, but the bluefish is edible and the dogfish is not edible. Now, if we could find some use for this fish—if we could make a poultry meal, for instance, out of the flesh of the dogfish, or if we could make water-white gelatine out of the bones of the dogfish, it is probable that in some way we might make a product that would be of benefit to the people in general.

There is another industry, which has recently started in Virginia, that is very interesting—that is, the drying of oysters. For a long time we have wondered why it would not be possible to dry or preserve oysters in some form so that they can be kept. Oysters are produced only at certain seasons of the year and then many times they are produced in excess. Now, our idea is that they might be preserved in some way. Of course, you are all familiar with canned oysters, but the trouble with canned oysters is the same as with the canning of all sea food, that the delicate flavor is practically spoiled; that is, it is spoiled for anyone who is familiar with the natural flavor of the oysters on the Atlantic or the Pacific coast, especially in the Eastern States.

This new industry is based on the fact that under a vacuum the oysters may be dried and ground up and in that stage may be sterilized and preserved in a small vial, and then, when you are ready to use them, these dried oysters may be placed in a pint of milk and you can make an oyster stew. Of course, it is not exactly as good as an oyster stew made from the fresh oysters; but in many ways the essential ingredients of the original oyster is there, except that in the drying process in the vacuum you have extracted the water and reduced the bulk, we will say, to just one-sixth of its original volume.

The CHAIRMAN. It would be good enough for a man who lived in Iowa?

Dr. CLARK. Possibly.

Mr. HOWELL. Are they the canned oysters we have in the interior?

Dr. CLARK. No, sir. The only objection to this method is that the oyster itself is in such a finely divided state that the people are not sure whether they are getting an oyster, and many people would prefer to get canned ones so they can see them; but this will be a convenient form for soda fountains and for use in hospitals and wherever small bulk is a factor.

Mr. HAWLEY. How does the flavor of the dried oyster compare with the canned oyster?

Dr. CLARK. The dried oyster made up with milk is very good, but of course its flavor would not be equal to that of the natural product.

Mr. LEE. You said the dogfish is not good to eat. Some one testified here last year that it is only the prejudice against its name, as it was a good fish to eat.

Dr. ALSBERG. I think I can answer that, because before I came to the Department of Agriculture I was at times employed in the Bureau of Fisheries. The dogfish is perfectly good to eat; I have

[illegible] The British and the [illegible] the bones are [illegible] safer to eat a piece of [illegible] being be- [illegible] putting the bones in your [illegible]

[illegible] The Japanese [illegible] the skate. The skate [illegible] and in southern [illegible] and is considered [illegible] I think, [illegible]

Mr. [illegible] the name there [illegible]

[illegible]

The CHAIRMAN. But you can't change his looks, can you?

Dr. ALBERT. No. I will like to tell one thing which Dr. Clark [illegible] We have done some work in the bureau on the use of fish meal as a feed. You know there is an enormous amount of fish now sold as fertilizer—the menhaden. The menhaden is a very oily fish and it comes in enormous quantities up and down the Atlantic coast. They catch the fish and press out the oil and sell the fish oil. All that remains behind is simply sold as fertilizer. Now, we have shown that the offal which is gotten in the canning of sardines, if properly handled so that it is not allowed to putrify or spoil, but is dried and then ground up, makes a most excellent stock feed. In cooperation with the Bureau of Animal Industry, we have been feeding such fish meal to poultry, hogs, and also to dairy cows, and we have shown that the eggs and milk that are produced have an excellent flavor. The value of fish meal as a feed is quite as good as the value of linseed cake or cottonseed cake or any of those highly nitrogenous feeds. It approximates in value meat meal.

We do not claim this as anything original, because in Norway and Sweden, Germany, and other countries, and on the Pacific coast this fish meal is well known and highly prized as a stock feed. But for some reason or other it has not come into general use in the United States. We have made these experiments, which are not original but are merely a duplication of experiments of European investigators, for the purpose of bringing them home to our feed producers and feed dealers. It has been the experience of our department that the average American does not believe what is printed in the German, French, or Scandinavian publications. He has to have it done in this country before he believes it.

Mr. HITCHCOCK. How does that price compare with the commercial article?

Dr. ALSBERG. We have in press a bulletin pointing out the value of the fish meal, which we hope will lead to its use. At the present time, of course, the value of this offal from the sardine canneries of Maine, for example, is what they can get for it as a fertilizer.

Mr. HELGESEN. The price of it in the country where it is used—how does that compare with the prices of other foods in the countries where it is generally used?

Dr. ALSBERG. It brings a higher price than cottonseed cake in Germany. It is being quoted on the Pacific coast at $50 to $60 a ton, about the same price as meat meal.

Mr. HELGESEN. It is a perfectly practical proposition, anyway?

Dr. ALSBERG. It is an absolutely practical proposition. We just have not awakened to it, and, of course, there are millions of pounds of that kind of waste in the salmon canneries. Of course, whether it would pay to make a meal in the salmon canneries on the Pacific coast and transport it to the Atlantic coast or to the Middle West would depend on the freight rates. I have not looked into that.

The CHAIRMAN. Does it contain any potash, Doctor?

Dr. ALSBERG. Yes; it contains potash, because all flesh is rich in potash.

The CHAIRMAN. It is more valuable than mineral fertilizer now?

Dr. ALSBERG. It might be at the present moment.

Dr. CLARK. I wish to make a statement. I do not wish to go on record as saying that the dogfish is not edible. I believe it is.

The CHAIRMAN. Just say he is ugly.

Dr. CLARK. I was speaking merely from the point of view of the fishing industry, which is that the dogfish is not considered edible. It is thrown overboard or destroyed in some way or other and, of course, is not listed in the markets. The Bureau of Fisheries does a great deal of educational work trying to make some use out of its flesh, aside from the fact that it might be used as a fish meat.

STATEMENT OF DR. C. L. ALSBERG, CHIEF OF THE BUREAU OF CHEMISTRY—Continued.

The CHAIRMAN. Dr. Alsberg, take up No. 58, "Oysters and other shellfish," a small item——

Dr. ALSBERG. That item is very similar to the fish item that has just been discussed, but the work has not been carried on very extensively under the direction of Dr. Clark, because it seemed more practical to have it done in connection with the bacteriological work of the bureau. It consists of developing the best methods for shipping oysters so that they will arrive in proper condition; in developing a package which will prevent the oysters from being contaminated with melting ice, the same proposition we have in the case of poultry, and showing what temperatures have to be used in handling it. It also has to do with the sanitary conditions of shellfish.

Originally we asked, three years ago, for $25,000. The reason we asked for that sum was that we wanted sufficient money to make a sanitary survey of the oyster beds so we could be sure that no oysters that had come from the mouths of sewers or from other polluted areas were put in interstate commerce. At that time this committee very properly raised the question whether that was public-health work, and I made the statement that I did not care particularly who did the work so long as it was done. In consequence of the question having been raised, we have been cooperating with the Public Health Service and have been gradually making a sanitary survey of the oyster beds of the north Atlantic seaboard, the bulk of the work being

Service. We have cooperated to the work and some of the shipping

make that very clear, because the es this line of work differ from Health Service? You say you do the

Health Service is concerned are likely to transmit typhoid. with that question we also take action shipments of oysters we find there are certain other chemical is the problem of how oysters modified, how long they should be and the like. Then there comes ing of oysters. You oysters in water not so salt as swell up in that water and it appar- gallon than there would be if certain questions which the practice. They state, for right into water of less stays swelled up, so it is not an making to show that the swelling if they will leave them in these time they will shrink back perpetrated on the con- is to be investigated. We We notified the shippers of liable to prosecution if they sewers without first having waters where they purify them- days in unpolluted waters state that they could not do because, if they took the salinity in the harbor and salinity of the water was That is true, but they swell We have to make an investigation

investigations of that kind, which are not of the Public Health Service, that we have to carry They bear directly on the food and drugs act.

THE CHAIRMAN. Is there anything further, Doctor?

DR. ALSBERG. I guess that is all on this item.

THE CHAIRMAN. All right, take the next item. "For the biological of food and drug products and substances used in the

DR. ALSBERG. We have under that a series of investigations which have to do more or less with nutrition. The first and one of the most important pieces of work that is under way on this investigation is the study of the constituents of the common cereals and similar agricultural products. Formerly we thought it was enough to judge the feeding value of, say, corn if we knew how much nitrogen was in it,

and then we could calculate its feeding value. Now we know that that gives us only one of the indications of what the feeding value of such an article is. We know that the various proteins differ in their feeding value. For example, you can not keep an animal alive on a diet of nothing but corn or nothing but wheat; neither corn nor wheat is a complete diet. There are very few things, except meat, eggs, and milk, particularly milk, which are a complete diet. Now, the reason for that is that the proteins—these albumens which occur in such a cereal as wheat or corn—lack certain constituents. They are not complete. They have not got all the constituents of the albumens that we find in flesh or in milk; consequently, as a growing animal is building up flesh or a cow is forming milk it does not get from a diet like that all the constituents which it needs, or it gets them in only a small quantity. The consequence is that, unless we know just exactly which of all these necessary constituents are present in corn, wheat, rye, alfalfa, and the rest of them—know in what respect those particular feeds lack certain valuable ingredients—we would not have the information on which to supplement the feed.

Let me give you an illustration. Take kafir corn. We have found out in the course of these investigations (we have not yet published it) that kafir corn has very little of a certain substance which has been called histidin. It is not necessary for me to go into a description of it. It is present in small amount in kafir corn. It is one of the substances without which an animal can not live; a substance made by plants but which the animal organism is not capable of making. We know probably one of the reasons you can not keep an animal alive on a feed of kafir corn with nothing else in the diet except the necessary amount of water and salt. It is that kafir corn lacks this particular substance, as we have discovered. Now, if you are going to feed an animal on kafir corn, the logical thing is to supplement the diet with something particularly rich in this substance which kafir corn lacks. There is such a thing on the market, which is not very expensive, and that is dried blood, a product of the slaughter house. Dried blood contains about 16 per cent of this substance, histidin, which is lacking in kafir corn. The next investigation will be to perform feeding experiments in which we will have one group of animals feeding mainly on kafir corn and another group on kafir corn supplemented with a small amount of dried-blood meal. If our hypothesis is correct, we will get much better growth and much greater production of flesh with the mixed feed than we will with the single feed.

I think these investigations show why, or at least tend to show why, wheat and corn alone, or any other cereal alone, is not a particularly good food. Take the fattening of hogs, for instance. The amount of the protein—that is to say, the expensive nitrogenous constituent—of such a thing as wheat or corn that can be used by a growing pig to build flesh is only about 25 per cent of the feed. If you feed the same amount of nitrogen to a growing pig in the form of milk or flesh meal, he utilizes about 60 per cent of what you feed. Obviously, if we can find out by investigations what the corn lacks, what the wheat lacks, that makes it only 25 per cent utilizable by a growing pig, then we can supply that which it lacks in small quantity to get a feed in which he will use more of the corn and more of the wheat than he does at present.

[illegible] of investigation that we are making [illegible] to know [illegible]

[illegible] whether it is necessary to have [illegible]

[illegible] any investigation that I make [illegible] others will know what [illegible] animal. If I remove [illegible] like this: The pig takes from [illegible] and a small amount of soda. Now [illegible] with a large amount of potash will more [illegible] the excess potash is eliminated and [illegible] the chloride of potash, which [illegible] which is a necessary constituent [illegible] of chlorine you feed the animal system [illegible] which supplies the animal with [illegible] If you feed potassium chloride, you [illegible] results because potassium chloride [illegible] In other words, you have got a [illegible] and the excessive potash leads to [illegible] to counteract that loss you feed [illegible]

[illegible] salt if you had cattle grazing [illegible]

[illegible] a animal husbandry. I can [illegible] physiology. I should say yes.

[illegible] experience that it is not of [illegible] go to the salt licks and put in a [illegible] salt when they should be lying [illegible] they will get up and walk 3 or 4 [illegible] where they will congregate and [illegible]

[illegible] another factor with which I, not [illegible] familiar.

[illegible] bought any salt 1 or 25 years. I found [illegible] Those are practical things perhaps [illegible]

[illegible] that, Doctor? "Ni- [illegible] seconds." I presume that is the same [illegible]

[illegible] vegetable proteins.

[illegible] there is the effect upon health [illegible]

[illegible] investigation is to furnish information for [illegible] You know that there [illegible] which yield to water an extract [illegible] known as soaphora, soaproot, etc. [illegible] substances in those plant [illegible] to boiling the plant with water [illegible] which produce foaming and known as [illegible] which foam like soap. Now, [illegible] substances are [illegible] of food [illegible] old days. [illegible] the [illegible] became as big a [illegible] as it is now. [illegible] was [illegible] with various soaps as were made with sugar

and fruit juices. Now, the sugar and fruit juice have considerable body, and these soda waters made in that way foam when you charge them with carbonic acid. When the carbonic acid is liberated you get a foam. The consumer was used to a foaming pop. Manufacturers wanted to use as little fruit as possible, or even use artificial flavors, and they produced a product which does not foam. The consumer is used to the foaming pop and wonders what is the matter with it; so the use of some of these soapbark extracts was devised to make the product foam and give it the appearance of having body.

The same thing is being done by the manufacturers of egg products. They are putting dried white of eggs on the market to sell to bakers and confectioners to make these whites of eggs coatings or tops on cakes or candy, and the like. They take and mix with the white of egg a certain amount of soapbark extract; the soapbark foams, and a little white of egg will go a great deal further than white of egg that has not got any soapbark extract mixed with it.

Some of these soap-barks are poisonous, but nobody has ever studied exactly how poisonous they are or whether they all are poisonous. They are nearly all poisonous if you give them hypodermically; they are fatal that way, or if you inject them into the blood stream, but if you take them by mouth they are not so poisonous, and some of them perhaps are not poisonous at all.

This investigation is to find out what effect on health the daily administration of small quantities of these saponins will have on an individual, in order that we may get the evidence with which to prosecute any one who puts these ingredients into a food product, provided we find that our investigations give us the data.

Mr. HAWLEY. Are they supposed to be habit-forming drugs?

Dr. ALSBERG. No; they are not habit-forming at all. I might as well describe what effects we have got so far. We fed them to cats. We chose cats because they are omnivorous animals and because the cat's digestive system is very easily upset, much more easily than the dog, the rabbit, or any other laboratory animals.

Mr. HAWLEY. I am glad to know that something will upset a cat.

Dr. ALSBERG. We fed small quantities of saponin to a series of cats for eight or nine months, and we found that they lost weight and strength in proportion to the amount of the dose. They rapidly regained their weight and their strength when we ceased feeding them. It also had a slight effect on the blood, but when they are taken by the mouth they are not virulent poisons. If they were, of course we would not have to make this investigation; we would long ago have taken action. Taken by the mouth one or two doses have no apparent effect, and so it is claimed by those who use them that they are not poisonous. This investigation is to find out what long-continued use of small doses will do.

Mr. HELGESEN. Is it a good antifat medicine?

Dr. ALSBERG. Yes, sir; but there are other things that would be pleasanter to take, because these things in large quantities are apt to be bitter and cause a scratching sensation in the back of your throat. A large dose of borax every day would accomplish the same result easily. In fact, a good many of the antifat remedies are nothing but borax.

Mr. HAWLEY. Of the 20-mule variety?

Dr. ALSBERG. Of that kind; yes.

[illegible] Is that the way Cottolene is made?

[illegible] That is the way a good many of these lard substi-

[illegible] do not recall whether Cottolene is one of them.

The CHAIRMAN. Did your bureau discover that process?

Dr. ALSBERG. No, sir; the process was originally discovered by a Frenchman by the name of Sabottier. The process was improved upon by an Englishman by the name of Norman, and further patents were taken out by an American by the name of Ellis. The rights under these various patents are now the subject of litigation.

The CHAIRMAN. All right, Doctor; if there is no further statement on that, take up item 60, "For the study and the improvement of methods of utilizing by-products of citrus fruits," and tell us about that briefly.

Dr. ALSBERG. This is work which has been done largely in California and to a less extent so far in Florida. The problem is this: The people of the State of California and also of the State of Florida are confronted with an overproduction of oranges and lemons and, in the case of Florida, also of grapefruit. In the case of California they can afford to ship to market only their choicest fruit because their freight charges are so great. That leaves them in California with a large quantity of culls, which for one reason or another, it does not pay to ship. The culls are particularly great in the lemon industry. Now, the question is to get something for those culls. That is the object of this work.

What we have been trying to do with refernece to the lemon culls is to make citric acid. Citric acid is the acid that makes lemons and limes sour, and it is very largely used in the pharmaceutical industry. For instance, a good many of the effervescent headache remedies that you see so widely advertised contain citric acid. Nearly all the citric acid is imported into this country from abroad, chiefly from Sicily, where it is made, not from lemons but mainly from limes. Some also comes from the West India limes.

We have been at work to recover from the lemon culls citric acid commercially. It is an article that varies in price. It is usually worth about 10 cents more a pound than cream of tartar. That makes it worth normally somewhere between 30 to 45 cents a pound, according to the price of cream of tartar, and of course the price of cream of tartar varies with the grape crop.

We have succeeded in making on a commercial scale citrate of lime from cull lemons. The manufacture of citrate of lime from cull lemons in itself is not a business proposition because it costs too much and the owner of the culls expects more than we can afford to give if we have citrate of lime as the only product. But if we can make successfully an oil of lemon, which sells for about $1 a pound—and after the earthquake at Messina it sold as high as $5 a pound—we could make the proposition of utilizing the cull lemons by manufacturing them into citric acid and lemon oil a paying proposition. We have succeeded in making lemon oil on a commercial scale out of these cull lemons, and we think at the present time that a factory making these by-products can be established in California. The thing is not perfected at present, because, as I say, we do not get the maximum that we think we ought to get out of the proposition because of the difficulty of extracting the oil from the lemons. You see in Italy the oil is hand pressed. The way it is done is this: Each lime or lemon is taken up, cut in half, the interior scooped

out, and the lemon peel pressed into a sponge by hand. When the sponge is full it is squeezed into a pail, and the process goes on. With labor at 20 cents a day, or thereabouts, you can make lemon oil, but you can not make lemon oil in that way in California. So we have been trying to invent machinery to do the same thing here. We have not yet perfected the machinery we are at work on, but we have the expectation that we can solve that problem. We can make oil now by pressing and separating it, but we do not get all the oil that is there, and we want to devise a method by which we can get all the oil and put the thing on a safer basis than it is at present.

I may say there has been organized by the members of the California Citrus Fruit Exchange a company to manufacure these products following the methods that we have suggested.

Mr. HELGESEN. Have you found the California lemons as rich in citric acid and lemon oil as the lemons of Sicily.

Dr. ALSBERG. They are not quite as rich in lemon oil. They are quite as rich in citric acid.

The CHAIRMAN. Any further questions, gentlemen?

Dr. ALSBERG. There are one or two other little features in connection with this. We are trying other methods of utilizing these culls; that is to say, we have done some work on the canning of grapefruit, on the making of orange oil from cull oranges, and on the manufacture of marmalades and similar preserves out of these culls.

The CHAIRMAN. Is there anything further on that item, Doctor? If not, take up the new item. "For investigation and experiment in the utilization, for coloring purposes, of raw materials grown or produced in the United States."

Let me say, I understand the Secretary is going to submit a supplemental estimate making this amount $50,000 instead of $20,000. I should like to have Dr. Alsberg discuss the item on the basis of a $50,000 instead of a $20,000 appropriation.

Dr. ALSBERG. I may say in the beginning that, as far as I know, the Bureau of Chemistry is the only office in the Federal service that has hitherto had anything to do with aniline dyes. The reason we have had to do with aniline dyes is a very simple one. Many foodstuffs are colored. They are usually colored with some aniline dye, and, in order to protect the consumer from the use of dyes that might be deleterious to health, there was undertaken in the department the certification of dyestuffs; that is to say, a manufacturer who wishes to sell a dyestuff for the coloring of foods may, if he chooses, submit to the department—that is, the Bureau of Chemistry—a sample of that dyestuff. The Bureau of Chemistry then examines it for its purity and its nature.

At the same time the manufacturer makes affidavits to the department that he guarantees this product to be pure and to come within the standards that have been laid down by the department for dyestuffs. Then, if after the examination of the dyestuff the bureau finds that it is a harmless dye of the required degree of purity, the certificate of the manufacturer is accepted and the manufacturer sells that article under an assigned number as a certified dye. The reason that was undertaken (it was undertaken beginning with the enactment of the food and drugs act) is that the amount of dyestuffs that is used

in any food product is so small that to prevent the use of improper dyestuffs in a food, if we had only the food to examine, would be very difficult. Where you are dealing with one or two parts of dyestuff in hundreds of thousands of parts of other material you have not enough dyestuff to allow examination for purity.

This work has been going on in the bureau since 1907, and as a result a number of men in the bureau have acquired very considerable familiarity with handling dyes and with the dyestuff industry. Therefore it occurred to the department that if Congress had any desire to have the Government cooperate in the creation of a dyestuff industry (we need not go into that situation—everybody is familiar with it), the Bureau of Chemistry, in view of the very considerable experience it already had, might be a proper agency to undertake such work toward the creation of a dyestuff industry in this country.

The CHAIRMAN. Doctor, I wish, as a matter of information, that you would go into the dyestuff situation briefly.

Dr. ALSBERG. If you do not mind, I will ask Dr. Gibbs, who has looked into it, to make a statement on that point.

The CHAIRMAN. It is a very important matter, in my opinion, and I should like to have it discussed fully.

Dr. ALSBERG. Will it be agreeable to you to hear Dr. Gibbs?

The CHAIRMAN. Yes; entirely.

STATEMENT OF DR. H. D. GIBBS, CHEMIST IN CHARGE OF COLOR LABORATORY, BUREAU OF CHEMISTRY.

Dr. GIBBS. The whole question of the dyestuff industry in America has been gone into at great length and in a most exhaustive manner in a hearing that was held before the Ways and Means Committee a very short time ago in discussion of House bill 702. The evidence which was taken at that time was so voluminous that it has not yet appeared in print, but it will appear in a very short time, I am informed. At that hearing it was brought out by the people in America who know the most about the manufacture of dyes and the present situation that prior to a year or so ago there was a very small quantity of dyes made in this country. The shortage of dyes began to be extremely acute about a year ago, and there have been some manufacturers who have made great efforts to increase this supply.

That there has been no dye industry of any great magnitude in this country is due to a number of causes—primarily to foreign competition and also to the fact that the dye industry is dependent upon many chemical industries. It is not possible to maintain a dye industry as a separate industry; it must correlate with many chemical industries. Heretofore the manufacturers have contented themselves with assembling a few raw materials, or intermediate products, as they are known, and these intermediate products are made by chemical industries of other countries and imported here. To have a complete chemical industry in this country it is necessary to start with the raw material, make the intermediate pruducts in large quantities, and then assemble these into the large number of dyes which are found commercially upon the market.

A popular example of this has been given. The greatest scarcity is felt in the blues and greens. To make some of these colors, you must have a well-known ketone, called "Michler's" ketone. To make that

ketone, you must have a substance called "phosgene." Phosgene has been made in this country only in very small quantities and, I believe, only recently and is not made to any extent even yet. In addition to that, you must have dimethylaniline. The manufacture of dimethylaniline is only carried on to a limited extent in this country. To make the dimethylaniline, you must have aniline; and to make aniline you must have nitrobenzene, and to make nitrobenzene you must have benzene itself, which is a product of coal tar and the by-products from coke ovens. Thus many processes are necessary before you produce a basal substance for the manufacture of a number of dyes. The same thing can be said of a larger number of other dyes.

Now, these industries for the manufacture of raw materials in this country are just coming into existence to a limited extent. The explosive industry requires raw products of the same nature as the dye industry. It has demanded that the coke ovens save their by-products, so that it may be furnished with benzene and toluene for the manufacture of explosives, and at the same time producing the basal products for the dye industry.

The dye industries at the present have difficulty in getting the raw materials they desire, because they are largely used by the explosive industries. A dye plant can be turned over to the manufacture of explosives in about one week and the process can be reversed in about one week. The explosive part of the business can be discontinued and the manufacture of dyes begun by making a few changes in the same plant.

The CHAIRMAN. We get our dyestuffs from Germany, most of them, do we not?

Dr. GIBBS. We have.

The CHAIRMAN. We have been doing so?

Dr. GIBBS. Yes, sir. 80 per cent of the dyes imported into this country have been imported from Germany.

The CHAIRMAN. Is it your opinion that with proper encouragement we can build up such an industry in this country as to put ourselves on a self-sustaining basis?

Dr. GIBBS. We are absolutely certain.

Mr. LEE. Would it require any very great outlay?

Dr. GIBBS. A very great outlay.

Mr. HAWLEY. What is the total value of that product in this country—that is, of the amount used?

Dr. GIBBS. The amount used in this country is about $15,000,000 to $18,000,000 per year at the manufacturers' price.

The CHAIRMAN. That is the manufacturers' cost?

Dr. GIBBS. Yes, sir.

The CHAIRMAN. That is what the manufacturers pay for it, or is that the original cost?

Dr. GIBBS. That is approximately the cost to manufacture the dyes which are used in this country. The selling price is entirely problematical, especially at this time. Some dyes have advanced 1,000 per cent or more within the last year.

Mr. HAWLEY. Can we make all the dyes they make in Germany?

Dr. GIBBS. We can when our chemists and artisans have acquired the proper chemical knowledge and our manufacturers have acquired the art. It is merely a question of experimental work to improve the processes. There are many processes. It is very easy to make dyes

some dyes; that is to say, in the laboratory, in a test tube. We can carry on reactions and make a dye, but to make it profitably we must produce all the dye which should be produced from the raw material; that is, there should be a satisfactory yield; there should be no unnecessary loss. If we can increase the yields 20 to 30 per cent, it means an enormous increase in the profits due to the reduction in cost of manufacture.

Mr. HELGESEN. Have the manufacturing processes of these dyes been held as a trade secret in Germany?

Dr. GIBBS. Some of them are trade secrets and some of them have been patented, and many of the patents have expired, and our manufacturers find now, in trying to work these patents, that the specifications were not accurate, and that the processes will not work. It requires a great deal of experimental work to adapt laboratory research work to manufacturing conditions. The British Government has recently appropriated $400,000 for what the Bureau of Chemistry is asking $50,000 for the same purpose exactly, to develop the dye industry.

Mr. HELGESEN. The British Government, however, would go into the manufacture itself, would it not?

Dr. GIBBS. The British Government has fostered a manufacturing industry in Great Britain by appropriating £3,000,000, an equal quantity to be subscribed by the general public, for the establishment of a dye industry in Great Britain.

The CHAIRMAN. Mr. Gibbs, what would your method be, after you had discovered your processes, to have it introduced commercially? I mean, how would you reach the men who are to produce this dye—by processes of education, by coming into contact with them, by talking with them, showing what can be done, and showing them the processes?

Dr. GIBBS. That is hardly a detail for me to consider, but I will say it is not necessary to go after them the way you go after the farmer. They will come to us. They want to know these little secrets, and they would be very glad if we could tell them many things they wish to know. For instance, the manufacturer of indigo requires phthalic acid, and I am informed that in America no one knows how to produce phthalic acid at a profit.

The CHAIRMAN. While you are on that subject, I have had probably 500 letters on the subject of dyestuffs in the last six months. Is it your opinion that we can establish this industry if we go at it right?

Dr. GIBBS. Without any doubt at all.

The CHAIRMAN. And will $50,000 be enough to start you off with?

Dr. GIBBS. It will Yes; it will start us.

Mr. LEE. How long do you think it will take you to acquire the knowledge these men want?

Dr. GIBBS. We could not do it all. Many of the dye factories in Germany employ 300, 400, or 500 chemists in one factory. We can only help. We propose to do as much as we possibly can and take up what seem to be the most important problems, but there are many other problems of a different nature that are very interesting and should be investigated. For instance, the utilization of the products of agriculture for dyes and dyeing.

[illegible] we can begin to manu-
[illegible] profit in this country
[illegible] many years before
[illegible] textile industries of the
[illegible] the leather manu-
[illegible] You will notice that
[illegible] blue-white
[illegible]

[illegible] into the matter of
[illegible] have an explosive in-
[illegible] materials. When the
[illegible] can be used for the
[illegible] the dye industry nor an
[illegible] to go into these chem-
[illegible] we have a dye industry,
[illegible] as I mentioned, in
[illegible] explosives.
[illegible] attempt in this country
[illegible]
[illegible] by a number of manufac-
[illegible] business by foreign compe-
[illegible] were shipped in here
[illegible] the manufacture of the
[illegible] in this country that
[illegible] last 5 years or so has manu-
[illegible] they were driven from one
[illegible]
[illegible] any serious efforts have
[illegible] on a commercial scale?
[illegible] as attempts at the present
[illegible]
[illegible] except this time?
[illegible] operated for many years,
[illegible] I know of, and possibly some
[illegible] the last two years.
[illegible] any further statement on
[illegible]

Mr. [illegible]. We ought to put a tariff on that industry, ought we not?

Dr. Grimes. The Ways and Means Committee had a hearing on H. R. 702 and took up that question.

Mr. Hudspeth. That is what H. R. 702 is for, is it not?

Dr. Grimes. Yes. That is all I think of.

STATEMENT OF DR. C. L. ALSBERG, CHIEF OF THE BUREAU OF CHEMISTRY Continued.

Dr. Alsberg. I should like to put one thing in the record, Mr. Chairman, if I may be permitted.

The Chairman. In this connection?

Dr. Alsberg. Yes. I should like to take this occasion to explain definitely the relation between the Bureau of Chemistry and the Bureau of Standards of the Department of Commerce. There are a

good many items in the appropriations of both bureaus which, on the surface, seem similar, but which when analyzed in the light of what is actually being done show that there is not any similarity at all or any question of duplication. This is one of them. The Bureau of Standards has a certain authority to study colors and to study color standards. Its work in that connection consists in devising methods for measuring the intensity of colors and the intensity of colored articles. For example, they have studied for the Bureau of Internal Revenue the methods of measuring the color of butter and of oleomargarine, and the methods which they have devised for making those tests are used by the Bureau of Internal Revenue, and I am told that there are now pending in the House a series of bills in which the measurement of the colors of butter and oleomargarine are determined according to the result of the investigations of the Bureau of Standards.

The Bureau of Standards has, for instance, investigated cottonseed oil; yet there is no duplication between the work of the Bureau of Chemistry and the work of the Bureau of Standards. Their investigation of cottonseed oil was for the purpose of devising a method by which the color of cottonseed oil could be accurately determined for the purpose of standardizing cottonseed oil and preventing disputes in commercial transactions.

The work of the Bureau of Standards, then, consists in testing and standardizing and measuring various articles. Our work has to do with the production of some of those articles. Thus, the Bureau of Standards' work here on color has to do with methods for measuring the intensity of colors, and mixtures of colors, both in the pure state and in cases of articles that have been colored. Our work, the work proposed here, consists in investigating methods for the manufacture and production of those colors. Our work in the past on colors has been limited to the study of the colors that are found in foods.

In other words, there is a very logical line of division between the Bureau of Chemistry of the Department of Agriculture generally and the Bureau of Standards. Apart from our regulatory work, we have to do with production. They have to do with the standardization of certain lines of products, the standardization of which is not otherwise provided for by Congress. That applies pretty generally to the work and is so understood by Director Stratton, of the Bureau of Standards, and by myself. We are in constant communication and are cooperating in many lines.

The CHAIRMAN. So you make the broad statement that there is no duplication of work?

Dr. ALSBERG. None.

The CHAIRMAN. Your next item is "For the purchase and equipment of a traveling laboratory, $7,500."

Dr. ALSBERG. One of the things which the Bureau of Chemistry is charged with doing in connection with the enforcement of the food and drugs act is the supervision of the milk that is shipped in interstate commerce. We have to supervise the shipment of milk to see not only that the milk which goes into interstate commerce is neither watered nor skimmed but also that it is not filthy nor contaminated, and particularly not contaminated with organisms that might carry disease.

[illegible]

[illegible]

[illegible]

it has been our experience in the department generally that where you combine a regulatory function—that is to say, a detective function—with a constructive function, like dairy inspection, the detective function kills an inspector's value as an educator. He is not trusted, and he does not accomplish anything. So in the Bureau of Chemistry, where we have both the law to enforce and the constructive work to do, we have to separate the two functions; they do not mix. A man does not absorb information—does not want to take advice—from a man who has some of the functions of a detective. That may seem strange, but it has been our experience that in mixing the two things together you kill the constructive side. A great danger in a department or a bureau which has a law to enforce is that the law will strangle its constructive work, and we are constantly struggling with that in the Bureau of Chemistry, which is in that unfortunate dilemma.

I may say that the dairy inspector is not a chemist, and we have to have a chemical examination of the milk as it comes from the herd. It is not really fair to prosecute a man for substandard milk if his cows are not actually giving standard milk. It may be better to tell him to change his cows or give them some different feed. We have to send a chemist along. The chemist is not a dairyman.

Mr. STEELE. You have a supervision of these dairy herds and plants that are shipping in interstate commerce? That is your part of the work?

Dr. ALSBERG. No; we have no legal authority to do anything in so far as inspecting a dairy that does interstate commerce business is concerned. If a man wants to refuse our people access to his buildings and grounds, he is entirely within his rights, but we find, particularly the way we are doing the work now, that the farmer realizes that we are not after him to prosecute him if we can help him. We are rarely refused access to his plant, and we usually find that he takes our advice. But we have no authority in law to compel him to do anything. All we can do is to seize his milk, after it has passed into interstate commerce, if it is watered, or skimmed, or filthy, or contaminated.

Mr. STEELE. I have heard a good deal of complaint about your sending out men. I do not know whether it is this bureau or some other. You send out some one and he instructs the dairyman, the little dairyman, for instance, that he has got to build his barns under certain plans, and after he has put in $200 or $300—he is a poor man—then, in 30 or 40 days another man comes along and says, "you tear it down and build it this way."

Dr. ALSBERG. I will tell you what you probably have in mind. Some farmers in some sections of the country are visited by three or four different inspectors during the same period. Take a man, for instance, in western New York. He is shipping milk sometimes to New York City; at other times he may ship milk to Rochester, and at other times he may ship milk into Buffalo. Now, he is going to be inspected by four different people. He will be inspected by the dairy commissioner or commissioner of agriculture of the State. Then he has got to get a permit to ship milk into New York City, and New York City sends another inspector up who tells him what he wants him to do. Then he sends his milk into Rochester, and Rochester sends out its inspector. Buffalo does the same, and, if he

... other places, there may be an in-
... place to which he wants to ship.
... have reference to.
... to anything he does not
... as milk in interstate commerce
... discriminated.
... mean the entire
... agriculture has no authority
... knowing about Mr. Steele's
... not know what section
... which I have just outlined actu-
... Now York, as I happen to know. It does
... distinction between the various
... assistance to the dairymen.
... you establish your little
... rather than to have these little
... dairy, you would prefer to
have ... in a low salary.

Dr. ALSBERG. It is not quite establishing laboratories all over the country, but something like this: We go to a town and ship our equipment there where we are going to do our work. We hire a couple of rooms and establish our laboratories. It takes some time to express our stuff there, it takes three or four days to set our things up, and we pay rent for two weeks while there, and it takes us three or four days to pack up again.

Mr. STEELE. Your point is that this scheme would be more advantageous and more economical?

Dr. ALSBERG. We figure we can save about $125 a fortnight by investing some money in a car.

Mr. STEELE. I think you could.

Dr. ALSBERG. That is the proposition. It is just a business proposition.

The CHAIRMAN. I think the committee understands that pretty well.

Your next item is the enforcement of the food and drugs act, and you seem to have an increase there of $50,000, which, you say, is due, first, to the great increase in the price of chemicals used in the analysis of drugs and foods and, second, to the large number of cases under the Sherley amendment of the food and drugs act coming to trial next year, some of them involving a good deal of expense, and, third, to the expected increase in the number of cases under the net-weight amendment, which will add to the expense of enforcing the law. Suppose you go ahead now and tell us about these increases.

Dr. ALSBERG. It has been a considerable time, at least a year or ... there has been any appreciable increase in the money for ... nt of the food-and-drugs act, and the work naturally ... This year the increases are particularly necessary

because of the increased price of chemicals for one thing, which is very great, and to the increase in the cost of transacting the ordinary business under the food-and-drugs act.

I have a list here, which may interest you, of some of the things we use. Of course, we do not use very large quantities of these substances, but we use hundreds of others like them, and the total aggregate is very large. For example, I have on my list acetic anhydrid, which in 1915 cost 63 cents a pound and now costs $1.40, or at least did when this list was compiled.

The CHAIRMAN. How much do you use of that now?

Dr. ALSBERG. This particular reagent we do not use a great deal of. I suppose we use 100 pounds in the course of the year.

Of none of these things on this list do we use a very large quantity. We use no very large quantities of any one reagent, but there are hundreds of reagents. Thus hydroquinone, which we use in the laboratory and also for our photographic work, which in 1915 cost 59 cents a pound now costs $4.35 a pound. Glass wool, for example, which is used to filter with (I could not say how much we use—not a great deal of it), in 1915 was worth $2.80 and is now worth $4.25 a pound. There is peptone, which we use in our cultures in bacteriology, which, in 1915, cost $3.13 and is now worth $6 a pound. I might continue that list indefinitely. That applies also to chemical apparatus, most of which comes from Germany. Combustion boats have increased in cost 4 cents each; drop bottles have increased 10½ cents each; dessicators, 8 inches in diameter, an increase in price of $1.26 for each one, that involving an increase in the cost to the bureau for the number we use of about $80, and so it goes down the list.

The CHAIRMAN. Can you show by any statement that you have prepared or can you prepare a statement to show just what amount in the way of money increase there has been on account of this situation?

Dr. ALSBERG. I can make an attempt. I can not predict, Mr. Chairman, how successful it may be.

The bureau is in the habit of carrying a considerable supply on hand. We aim to carry from 18 months' to 2 years' supply on hand to keep us going, for the reason that most of the materials that we use come from Europe. It usually takes us six months to get them here. If there is any hitch anywhere, it may take us a year to get them. So, in order to be safe, it is necessary for us to carry from one year's to two years' supply ahead. Now, fortunately for us, at the outbreak of the war we had two years' supply of most articles on hand, and we have been living on our fat, as it were, ever since. We have been living on the materials which we had on hand, in order not to pay war prices, hoping the war would be over and things would be back at normal. So, it would be very hard for me to give you much more than an estimate of how much more it will cost during the coming year.

The CHAIRMAN. Can you get these things?

Dr. ALSBERG. Many of them we can get at a very much increased cost.

The CHAIRMAN. Let me ask you this question. I think you will see the importance of it. How much of this $50,000 do you expect to use on account of this increase in the price of the materials?

Dr. Alsberg. I would [illegible]

The Chairman. Of about [illegible]

Dr. Alsberg. [illegible] that for the purpose of the record [illegible]

(The record referred to is as follows:)

[illegible]

The annual consumption of drugs, chemicals, etc., [illegible] by the Bureau of Chemistry is approximately $11,000. This cost is based on prices [illegible] present prices of the same items in the same amounts [illegible] that is, an increase of 91%.

The yearly consumption by the Bureau of Chemistry [illegible] is approximately $7,000 at normal prices. [illegible] per cent of the amount which is estimated is extremely [illegible] that [illegible] during the next fiscal year will be $[illegible].

The total additional cost of these two classes of supplies [illegible] will be approximately $20,000.

The Chairman. How much would you use on account of the Sherley amendment?

Dr. Alsberg. That is a matter we can only guess at. The Sherley amendment went into effect in 1912. It takes about three years after the law is enacted to get the cases coming in in considerable numbers through the courts. The cases are coming through the courts at the present time. There are several hundred at least pending now, and there will be some hundreds more during the course of a year. We do not know how many of those cases are going to be bitterly contested and how many are not going to be so contested. If any considerable number of them are bitterly contested, the sums which will have to be expended for travel and subsistence for our own men in the places where they are tried and for the employment of expert witnesses who are not connected with the department may be very large. I can not say any more than make that general statement. The same thing applies in a way to the net-weight amendment.

The Chairman. But you feel you would need $25,000 at least for the enforcement of the Sherley amendment and also the net-weight amendment?

Dr. Alsberg. Yes; at least that much.

The Chairman. Gentlemen, are there any questions as to the reasons set forth in the estimates that you would like to ask Dr. Alsberg? If not I will ask him a few questions on a certain line.

I would like if you could not give the committee, very briefly, some statement in reference to your joint committee on standards. Give us something of its origin and its organization, then the legal authority upon which you base it, and a little something of its function; and, if you want to, how much trouble it has gotten you into.

Dr. Alsberg. So far, none, sir.

The Chairman. All right; you may proceed.

Dr. Alsberg. When I came into the Bureau of Chemistry the most conspicuous thing with which I was confronted in the enforcement of the food and drugs act was the lack of uniformity in the legislation that had been enacted by the various States and by the Federal Government and in the manner of enforcing the various acts of the States [illegible] the Federal Government. The conditions which then existed [illegible] to a great extent still exist, was that a man had to have

rent label for his goods for half the States he shipped to. For ple, a man might ship some goods to Florida and have to label differently from goods to Georgia and neither Georgia nor la labels would be satisfactory for Alabama. And maybe he ship some goods to Alabama and the jobber there would have omer in Georgia and would ship those goods into Georgia, and an in Georgia would be prosecuted by the local authorities, se his goods were not in compliance with tthe laws of the State rgia. Such were the conditions that existed to a large extent hich still exist.

course, the Federal Government has nothing to do with the ing of the State laws. But there is another matter that some- makes just as much trouble as the difference between the laws various States, and that is the manner of administering the by the various State officials. It may be and it has happened wo neighboring States had practically identical or very similar yet the administration of those laws in the two States has been ferent that they might for all practical purposes have had nt laws.

eemed to the department that it might be possible to do some- on this latter question, and therefore the Secretary, in October, called a conference of all the State officials—invited them to to Washington and to talk over this question of lack of uni- ty in the administration of the Federal and the State laws. nly did he invite them to talk over this lack of uniformity, e invited them also to indicate in what way the Federal Gov- nt could cooperate with the various State governments for the se of making the enforcement of these laws more efficient, se logically the Federal Government should take charge of upervise the interstate shipments, and the State officials should he matter up in the States where the Federal Government lets atter rest.

that meeting two things were suggested. One thing was that ssociation of American Food, Drug, and Dairy Officials, which association that includes all the State commissioners that have or drug acts to administer, should cooperate by having a joint ittee on definitions and standards. That joint committee was sist of three members of this Association of American Food, and Dairy Officials, three members of the Association of l Agricultural Chemists (which includes all the State chemists, se in some States they have both a commissioner and a State st, while in some States those functions are merged), and three ers of the Department of Agriculture.

other recommendation was that the department devise ma- y by which it could supply the State officials with the infor- n which the Federal Government has on food and drug matters hich is not easily obtainable by State officials.

elieve something like 35 to 36 States, not counting the District umbia and Porto Rico, and the Department of Agriculture were ented at this meeting, which of course was a large majority of tates, because there are a few States which have no officials of kind. The Secretary, following this resolution which was ed, invited the associations to cooperate by naming their dele-

There were appointed by the Association of American Dairy,

[illegible] Dr. [illegible] Chief of the Bureau of Chemistry [illegible] Assistant [illegible] Dr. [illegible] Chemist [illegible] Bureau of Chemistry [illegible] committee. [illegible] a member of the Bureau of Chemistry [illegible] work of [illegible] Government and the States, and [illegible] Dairy, Food, [illegible]

[illegible] changes in the committee since then. The [illegible] Mr. Abbott, [illegible] committee, was [illegible] of course that he is not a voting member [illegible] with Dr. Dunbar as an [illegible] considerable number of meetings [illegible] a schedule of the work done by [illegible] have for me to read that here?

The CHAIRMAN. You might put it in the record.

Dr. ALLEN. I will submit that for the record. I find I do not have it here.

The CHAIRMAN. Just submit it for the record.

The statement referred to follows:

DEFINITIONS AND STANDARDS OF FOODS ADOPTED BY THE JOINT COMMITTEE ON DEFINITIONS AND STANDARDS.

FOOD INSPECTION DECISION 158.

CONDENSED MILK, EVAPORATED MILK, CONCENTRATED MILK.

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., March 26, 1915.

The Joint Committee on Definitions and Standards of the American Association of Dairy, Food and Drug Officials, the Association of Official Agricultural Chemists, and the United States Department of Agriculture, on November 20, 1914, adopted the following definition and standard for condensed milk, evaporated milk, concentrated milk:

"Condensed milk, evaporated milk, concentrated milk, is the product resulting from the evaporation of a considerable portion of the water from the whole, fresh, clean, lacteal secretion obtained by the complete milking of one or more healthy cows, properly fed and kept, excluding that obtained within 15 days before and 10 days after calving, and contains, all tolerances being allowed for, not less than 25.5 per cent of total solids and not less than 7.8 per cent of milk fat."

The foregoing definition is adopted as a guide for the officials of this department in enforcing the food and drugs act, and Food Inspection Decision No. 131 is revoked.

D. F. HOUSTON,
Secretary of Agriculture.

FOOD INSPECTION DECISION 160.

GLUTEN PRODUCTS AND "DIABETIC" FOOD.

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., January 3, 1916.

following definitions and standards for gluten products and "diabetic" food dopted by the Joint Committee on Definitions and Standards April 9, 1915, ere approved by the Association of American Dairy, Food, and Drug Officials 3, 1915, and by the Association of Official Agricultural Chemists November 5:

ound gluten is the clean, sound product made from wheat flour by the almost ete removal of starch and contains not more than 10 per cent of moisture, and, ated on the water-free basis, not less than 14.2 per cent of nitrogen, not more 5 per cent of nitrogen-free extract (using the protein factor 5.7), and not more .5 per cent of starch (as determined by the diastase method).

uten flour is the clean, sound product made from wheat flour by the removal ge part of the starch and contains not more than 10 per cent of moisture, and, ated on the water-free basis, not less than 7.1 per cent of nitrogen, not more 6 per cent of nitrogen-free extract (using the protein factor 5.7), and not more 4 per cent of starch (as determined by the diastase method).

uten flour, self-raising, is a gluten flour containing not more than 10 per cent of re, and leavening agents with or without salt.

iabetic' food.—Although most foods may be suitable under certain conditions use of persons suffering from diabetes, the term 'diabetic' as applied to food es a considerable lessening of the carbohydrates found in ordinary products of ne class, and this belief is fostered by many manufacturers on thier labels and r advertising literature.

diabetic' food contains not more than half as much glycogenic carbohydrates normal food of the same class. Any statement on the label which gives the sion that any single food in unlimited quantity is suitable for the diabetic t is false and misleading."

foregoing definitions and standards are adopted as a guide for the officials of partment in enforcing the food and drugs act.

D. F. HOUSTON,
Secretary of Agriculture.

FOOD INSPECTION DECISION 161.

MAPLE PRODUCTS.

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., January 3, 1916.

following definitions and standards for maple products were adopted by the ommittee on Definitions and Standards June 4, 1915, and were approved by the ation of American Dairy, Food, and Drug Officials August 3, 1915, and by the ation of Official Agricultural Chemists November 17, 1915:

ple sugar, maple concrete, is the solid product resulting from the evaporation of sap or maple sirup.

ple sirup is sirup made by the evaporation of maple sap or by the solution of concrete, and contains not more than 35 per cent of water and weighs not less l pounds to the gallon (231 cubic inches)."

foregoing definitions and standards are adopted as a guide for the officials of this ment in enforcing the food and drugs act.

D. F. HOUSTON,
Secretary of Agriculture.

[illegible] INSPECTION DECISION 162.

[illegible] EGG AND PLAIN NOODLES

[illegible] DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
Washington, D. C., January [illegible], 1916.

[illegible] egg noodles and plain noodles were [illegible] Standards June 4, 1915, and were [illegible] Food and Drug Official Association of Agricultural Chemists November 17, 1915, [illegible] pastes made from wheat flour and egg [illegible] of the solids of whole, sound egg [illegible]

[illegible] pastes made from wheat flour [illegible] of the solids of whole, sound egg [illegible]

[illegible] consideration.

[illegible] are given as a guide for the officials of [illegible]

D. F. HOUSTON,
Secretary of Agriculture.

[illegible] adopted by the Secretary of Agriculture [illegible] were carefully considered by the Joint [illegible] and recommended to the [illegible] Association of American Dairy, [illegible] for their guidance in the enforce[illegible]

[illegible] EGGS

[illegible] DEPARTMENT OF AGRICULTURE
[illegible] THE SECRETARY
Washington, D. C.

[illegible] Secretary of Agriculture by the act of [illegible] to fix [illegible] grades of eggs are hereby fixed and promul[illegible]

[illegible]

[illegible]	[illegible]	[illegible] "cracked" but not containing finely broken corn. (See general rule No. 4)
[illegible]	1	2
[illegible]	1	3
[illegible]	2	6
[illegible] per cent	2	4
[illegible] per cent.	3	5
[illegible] per cent.	5	7

[illegible] rule No. 4 for sample grade.

GENERAL RULES.

1. The corn in grades No. 1 to No. 5 inclusive, must be sweet.
2. White corn, all grades shall [illegible] at least 98 per cent white.
3. [illegible] all grades shall be at least 95 per cent yellow.
4. [illegible] all grades shall include corn of various colors not coming within [illegible] as provided for under white or yellow corn.

5) In addition to the various limits indicated, No. 6 corn may be musty, sour, d may also include corn of inferior quality, such as immature and badly blistered.
6) All corn that does not meet the requirements of either of the six numerical grades reason of an excessive percentage of moisture, damaged kernels, foreign matter, "cracked" corn, or corn that is hot, heat damaged, fire burnt, infested with live evils, or otherwise of distinctly low quality, shall be classed as sample grade.
7) In No. 6 and sample grade, reasons for so grading shall be stated on the inspector's tificate.
8) Finely broken corn shall include all broken particles of corn that will pass ough a perforated metal sieve with round holes nine sixty-fourths of an inch in ameter.
9) "Cracked" corn shall include all coarsely broken pieces of kernels that will ss through a perforated metal sieve with round holes one-quarter of an inch in ameter, except that the finely broken corn, as provided for under rule No. 8, shall t be considered as "cracked" corn.
10) It is understood that the damaged corn, the foreign material, including pieces cob, dirt, finely broken corn, other grains, etc., and the coarsely broken or "cracked" rn, as provided for under the various grades, shall be such as occur naturally in rn when handled under good commercial conditions.
11) Moisture percentages, as provided for in these grade specifications, shall nform to results obtained by the standard method and tester, as described in Circular No. 72, Bureau of Plant Industry, United States Department of Agriculture.
In testimony whereof I have hereunto set my hand and the official seal of the Department of Agriculture, this 3d day of January, 1914.

[SEAL.]

B. T. GALLOWAY,
Acting Secretary of Agriculture.

BJECTS UNDER CONSIDERATION BY THE JOINT COMMITTEE ON DEFINITIONS AND STANDARDS.

1. Flours and meals, exclusive of feeds.
2. Sirups, molasses, honeys.
3. Nonalcoholic and carbonated beverages.
4. Fruit juices and soda flavors.
5. Milk and milk products (dried milk, condensed milks, butter, cream).
6. Ice cream, ices, frozen custards, etc.
7. Cocoa and chocolate.
8. Vinegar.
9. Canned goods.
10. Metals in foods.
11. Baking powder and baking-powder chemicals.
12. Edible oils and fats, including hydrogenated fats.
13. Meat and plant extracts.
14. Breakfast foods.
15. Egg products (dried, frozen, etc.).
16. Dried fruits.
17. Condiments.
18. Edible cereal pastes.
19. Candy.
20. Pharmaceuticals (cod liver oil emulsion, colocynths, tr. nux vomica, saccharin ablets, hypophosphites, laudanum, asafoetida, beef, iron, and wine).
21. Pepsin-pancreatin.

Dr. ALSBERG. The practice of the committee has been to meet in Washington. I may say that the gentlemen who serve on the committee receive no salary for their services. Their only salary is that which they may receive as a State or Federal official. In some cases the States have paid their traveling expenses. There have been other instances where the State not being able to send a man to a meeting, the man has been authorized to come at the expense of the department.

Mr. STEELE. Are you arriving at a uniform line of progress?

Dr. ALSBERG. Yes; that is the point. We have come to agreements on definitions and standards for certain articles. It is a slow

business and have not covered a great many at the present time. When we can get an agreement as to what is a proper standard for a given article each group of three recommends that standard or description to the body it represents. It so happens that it is first recommended to the Association of American Food, Drug, and Dairy Officials. If they see fit they adopt it. It is then recommended to the Association of Official Agricultural Chemists. If they see fit they act on it and when it has been acted on by both of those bodies, if the Secretary of Agriculture sees fit to adopt it, he adopts it, and all the officials have something which they can use as a guide to unify their practices.

The CHAIRMAN. And that is the function of this committee?

Dr. ALSBERG. That is the function of this committee.

The CHAIRMAN. What legal authority does it rest upon, Doctor?

Dr. ALSBERG. It rests on the appropriation for the enforcement of the food and drugs act.

The CHAIRMAN. Is there anything further on that, gentlemen? If not, just one question and I think you can complete your statement. On page 214 of the estimates, item 4, "For investigating the grading, weighing, and handling of naval stores, and preparation of definite type samples thereof, including the employment of necessary persons and means in the city of Washington and elsewhere." How long will it be before you can complete that little line of work?

Dr. ALSBERG. Mr. Chairman, that depends upon what this committee desires to do or, at least, instructs us to do. The actual work on the preparation of standard-type samples, if that is all that is desired, can be completed very shortly. In fact, the standard grades or types are now established and the standard types for rosin have been adopted by law by the State of Florida and by the Boards of Trade of Savannah, New York, Pensacola, Mobile, and New Orleans, and also of Brunswick, Ga. In fact, they were adopted by those associations before the Bureau of Chemistry was really quite ready to have them adopted because of difficulties in obtaining the material of which to make the standard-grade samples.

The CHAIRMAN. What else can you do?

Dr. ALSBERG. What we can do is this: It would be an excellent thing if the department had authority and adequate appropriation to do what might be called extension work with reference to the production of rosin and naval stores. If it were possible to get all the makers of rosin and turpentine and distillers of rosin and turpentine to adopt the recommendations which we have made and are ready to make and show them how to put them in practice, we could increase the paper value of the output of naval stores by $3,000,000 at the least.

I do not say that would necessarily be the increase, because the increase would come from the production of more high-grade rosin and less low-grade rosin, and we are figuring on the increase of the value of high-grade rosin. Of course, producing more high-grade rosin will somewhat reduce its price, but as figures now stand we could increase the value of the production at least $3,000,000 a year. The trouble is to get that information back to the turpentine still in the woods. If the committee wishes our work to end with the preparation and distribution of proper standards and their adoption

by the boards of trade, that can be done; that feature can be entirely done in 1917.

The CHAIRMAN. As I understand it, the purpose of this item was to do about what you have completed, and the work of extension has not been brought to the attention of the committee?

Dr. ALSBERG. Except for one feature, and that is the preparation of a number of sets of the standard-grade samples to be supplied to the trade at cost, the control of those standard samples, and the reinspection of them to keep them correct in the same way that the cotton standards are handled. You see, they may be tampered with; they may be changed. We are trying to get material that does not change. We think we have it, but they may change and may be tampered with. It will require, we estimate, about $3,000 to prepare sets of the standard samples for the trade and about $2,000 to complete the work on grading, handling, and weighing of naval stores. The Government will be reimbursed for all standard samples distributed.

Mr. VEITCH. May I say that the rosin types are little cubes which contain pieces of colored glass to exactly match the grades, which, we think, is permanent in color. Unfortunately, owing to the war, since these glasses are produced abroad, we have not been able to supply the industry with sets of the standard types or grades.

The CHAIRMAN. Then, I am safe in saying if the question is asked, so far as this item is concerned, that it is completed according to the intention of Congress, except the supervision necessary to keep the standards correct?

Mr. VEITCH. It can be completed in the next fiscal year.

The CHAIRMAN. You would not have authority under this item, of course, to do extension work?

Mr. VEITCH. No, sir.

The CHAIRMAN. Is there any reason why this item should not be brought back under general expenses for your bureau?

Dr. ALSBERG. None whatever. I think the only reason why it was not put there in the first place was that it was introduced after the estimates had gone beyond the point where the Bureau of Chemistry was being considered.

The CHAIRMAN. It was added in the Senate, as a matter of fact.

If that completes your statement, we are very much obliged to you, and the committee will now stand in recess.

(Thereupon, at 6 o'clock p. m., the committee took a recess until Tuesday, February 1, 1916, at 10 o'clock a. m.)

32573—16——55

STATEMENT OF M. MILTON WHITNEY, CHIEF OF THE BUREAU OF SOILS

[illegible]

Mr. [illegible]

[illegible] at the same salaries?

Mr. [illegible]

[illegible] Yes. There is an increase [illegible] consisting in a lump fund for classi-[illegible]

Mr. [illegible] The lump fund is reduced [illegible]

[illegible] laboratory helper by transfer from [illegible]

Mr. [illegible]

[illegible] mechanical maker, by transfer of [illegible] $[illegible] for physical investigations, with [illegible] accordingly?

Mr. [illegible]

[illegible] With the change of designation?

Mr. [illegible] a change in the character of his work.

[illegible] machinist's helper, by transfer of [illegible] $[illegible] lump fund for investigation of fertilizer [illegible]

Mr. [illegible] The lump sum is reduced [illegible] machinist's work as a machinist's helper. That [illegible] statutory roll.

[illegible] these salaries been increased, and [illegible] reduced?

Mr. [illegible] Always.

[illegible] Page 120. "General expenses," and the first [illegible] Nos. 5, for chemical investigations of soil types, etc., $20,610, showing an apparent decrease of $1,740, due to the transfer of one

clerk at $900 and one laboratory helper at $840 to the statutory roll. Now, Doctor, I am going to ask you, as I have been asking others, to take your project book and briefly follow the projects there and tell me what you are doing, and if you desire any of your assistants to discuss these items after you have made a general statement, I would be glad to have them do so.

Mr. WHITNEY. Mr. Chairman, I do not suppose there is anything special under the general administration of the office of the chief of the bureau that would interest the committee. They are the routine matters—accounts, editorial work, supplies, files and records—the mere routine work of the administrative functions of the bureau.

The first item that will interest the committee is the research item of soil chemical investigations. If the committee would like to hear what we are doing there, we have Dr. Shorey. I would say however, that the resignation of Dr. Cameron about three months ago caused me to make some changes in the organization of the bureau, and Dr. Shorey was brought in at that time, so that he has been in actual charge of the line of soil chemical investigations for only a short time.

STATEMENT OF DR. E. C. SHOREY, BIOCHEMIST IN CHARGE OF SOIL CHEMICAL INVESTIGATIONS, BUREAU OF SOILS.

Dr. SHOREY. The projects as outlined in this statement are as I found them two months ago when I took charge of the work and cover fairly well the work, I think, as authorized by the appropriation bill. One or two of the projects are now inactive owing to the resignation of a man whose place has not yet been filled.

Special emphasis is being given to two of these projects. One is the investigation of the inorganic composition of soils. It is desirable, I think, to find out, if possible, what are the chemical differences, if any, between different soil types. Some attempt to hitch up, so to speak, the chemistry of the soil with the fundamental work of the soil survey.

The other project on which emphasis is being given is that dealing with the liming of soils. There is a good deal of attention being given just now by farmers and agricultural investigators to the use of lime in agriculture. While in one sense that may be considered a fertilizer problem, it is also an essential soil-chemistry problem.

The CHAIRMAN. Under that item what do you do, what are some of your methods, and what do you hope to accomplish by your investigation?

Dr. SHOREY. Under this last proposition?

The CHAIRMAN. Yes. It is a very important proposition—the liming of soils.

Dr. SHOREY. As I see it, the attempt should be made to find out what happens when you add lime to the soil. It is ordinarily considered as being a corrective of soil acidity, but there are other reactions taking place where lime is applied, and the whole thing is in a more or less chaotic condition so far as the chemist is concerned. There has been almost no work done on it from that point of view heretofore, and I have as yet only outlined in my mind what I would like to do. In general, the thing is to find out what takes place, the reaction between the soil and the lime, after it is added.

Mr ANDERSON. What is the practical benefit to be derived from soil analysis and the mixing and blending that is done under the term? What are we going to get out of it?

Dr SHOREY. Soil analysis is the primarily accepted term, but only a very small part of the work that is done. Under the project, Morgan composition of soils, the work consists of determining the chemical differences of soil, between soil types as fixed by the survey. There is an attempt to correlate the chemical work with that portion of the bureau that is doing what we consider the fundamental work.

Mr OVERMYER. Does it help in the selection of fertilizers?

Dr SHOREY. To a certain extent, yes. If you have an analysis of the soil and all the other information that it is possible to obtain regarding the soil, its past history, etc., a soil analysis is an aid in determining what treatment your soil should have.

Mr OVERMYER. If a farmer knows what is lacking in the soil, he can supply it, by fertilizer?

Dr SHOREY. This is not altogether true. You can not tell by soil analysis alone. That is the conception that many people have, but it is not borne out by experience.

Mr ANDERSON. Then what good is it?

Dr SHOREY. It is an aid. It is one thing to be [illegible] with the soil in cultivation.

Mr HOWARD. What do you account as your principal [illegible] in the line of work?

Dr SHOREY. I have to go back to the [illegible] of course. The main achievement in soil chemistry, as this bureau has been shown, is a better understanding of what takes place in the soil when you cultivate it, when you grow plants on it, and when you add fertilizer to it. It is an attempt to take the practice of agriculture out of a rule of thumb procedure and make it approach somewhat to a science. If a man is dependent on finding out how to do certain things by experience, he has to keep on experimenting, which he would not have to do if he knew the principles involved.

Mr HOWARD. I am trying to find out what principles you have found.

Dr WHITNEY. One of the most important practical things that has come out of the study of the chemistry of soils is the solution of a very important alkali problem. The bureau years ago took up the study of the alkali soils of the West. It is a subject that has given a good deal of concern to all of the countries of the world in arid climates. The English Government has confronted the problem for years in India, and it was not until the Bureau of Soils, through this very Division of Soil Chemistry, took up the study that we found the cause of the alkali, the source of the alkali, and the remedies for it, and whereas 20 years ago alkali was a curse to the soil; now it is no longer feared at all. We know exactly how we can handle it. We can handle it; they are handling it in the vast areas in the West, and they have got it under control. That is one of the important outcomes of this work.

Mr HAUGEN. How is alkali soil handled?

Dr WHITNEY. It is a matter of drainage. The alkali has accumulated because of the very small rainfall and the very small amount of natural drainage from soils. Now, the source of the alkali may [illegible] sometimes it is deep seated. Sometimes it is situated at a

higher elevation and works down and comes up through the soil to the surface. But in every case we have been able to determine where the source is, what the cause of the rise is, and to remedy it in most cases by efficient underdrainage and leaching out.

Mr. HAUGEN. Other bureaus seem to be doing the same kind of work of reclamation that you are doing.

Mr. WHITNEY. We established the principles. We are not working on that now. It was investigative work, and we never carried it beyond the investigative stage. There are several bureaus, several departments of the Government, working on the reclamation of the alkali lands.

Mr. HOWELL. Can you suggest any other treatment than drainage?

Mr. WHITNEY. That is all you need.

Mr. HELGESEN. In a dead-level country where we can not drain there would be no remedy at all?

Mr. WHITNEY. There is always the possibility of underdrainage—of getting down into pervious strata below; and that is one of the features which is to be considered in the drainage, carrying off of the alkali. If you can get down to a pervious stratum of sand or of gravel it is just as good as anything else.

Mr. HELGESEN. There is no sand or gravel there.

Mr. HAUGEN. Is that practical drainage?

Mr. WHITNEY. Yes.

Mr. HELGESEN. I suppose you might dig in spots, where the spots are not too large. You might dig a well, but that is about the only way you could get it there.

Mr. WHITNEY. These problems always have to be solved on the spot. You have to work out a problem in one set of conditions. It is not always an easy thing to do.

Mr. HELGESEN. We inquired the other day what effect manure would have in that country. It seems that that would do the work if you have enough of it. Of course, you could not do it on a large scale. It takes too much. But if you keep it up, it generally does away with the alkali.

Mr. WHITNEY. It is not as permanent, as final. Drainage is the real thing.

The CHAIRMAN. Anything further?

Dr. SHOREY. I think that covers the most important facts.

STATEMENT OF MR. MILTON WHITNEY, CHIEF OF THE BUREAU OF SOILS—Continued.

The CHAIRMAN. Take up item 29, Dr. Whitney, for physical investigations, and tell us what you are doing.

Mr. WHITNEY. Mr. Chairman, the gentleman in charge of this is out on the Pacific coast. I notified his assistant to be ready for the hearing, but I am sorry that in the confusion of leaving I forgot to notify him to be present.

The physical investigation is another one of those fundamental problems in the study of soils about which we have to be as fully prepared as possible in order to work out and control the operations of tillage. Achievements of the bureau in this line have been very great. In the first place, it was through the investigations and the practical applications of the methods of mechanical analysis of soils

that we have been able to separate the soils of the [illegible] and to [illegible] the [illegible] bearing of the soil survey.

Those results are quite old. We accomplished that work in the years 1904 and we showed at that time the relation between the texture of the soil and the crop adaptations, the class of crops that would grow and the character of the tillage that was [illegible]. Now, in our continuing investigations we are studying all of those problems that have to do with the texture, the [illegible] of plant life, the structure, the moisture of the soil, so that we can see what method we have of our methods of cultivation, and our methods of fertilization [illegible] to be proper, may have to be more or less [illegible] the soil for agriculture, and it is those problems that we are still [illegible].

Mr. [illegible]. Supposing a man in my district or any where else, wrote to the Department of Agriculture for information with reference to the soil, what kind of soil, what kind of crops would be suitable for that soil that he has got, could you tell him that?

Mr. Whitney. Yes; that will come under soil survey, item 31.

The Chairman. Anything further on this item? That is your home work?

Mr. Whitney. Yes, sir.

The Chairman. Item 30, "For exploration and investigation within the United States to determine possible sources of supply of potash, nitrates, and other natural fertilizers."

Mr. Whitney. That will probably be rather long in its presentation. Would you rather take the soil survey instead and finish up with that afterwards?

The Chairman. I am inclined to think it had better come here.

Mr. Whitney. Mr. Chairman, we have been working for a number of years on the fertilizer resources of the country. If you remember, three or four years ago our fertilizer people had some trouble with the German potash syndicate regarding the contract price and the amount of potash salts that they would be willling to assign to this country. At that time President Taft and the State Department seemed to think it was well for this country to see if we were able to develop a source of domestic supply of potash salts, so that we would not be entirely dependent on the German Government. Of course, that was several years before the present world situation developed. Since then the bureau, through the special appropriation Congress has given us, has been investigating the possible sources of supply of fertilizer material in this country, and at the outbreak of the European war I felt very much gratified with the results of the bureau's work. It had gone so far that I felt confident that there was an ample supply of fertilizing materials available in the United States, two of the sources, be[illegible] requiring development.

Since [illegible] has been in progress the fertilizer situation has [illegible]orially, and I have here a set of samples which will [illegible] committee wishes to go into it, just what we are

relying upon for our fertilizers and just where we are touched by the European situation.

The CHAIRMAN. Pass the samples around, Doctor. But what I think the committee would prefer you to do is to tell us what are your sources of fertilizer, both with respect to potash and nitrogen. Of course, we understand what your sources of potash are and what practical means might be adopted to make these supplies available to the people of the country. The fact of having discovered and catalogued them is very important, but the next important step is to try to find some practical method of development so as to get them into the hands of the people.

Mr. WHITNEY. Mr. Chairman, briefly I will say that we have been depending upon Germany for four important potash fertilizers—potassium sulphate, potassium chloride, kainit, and manure salts. We have imported those to the extent of about $13,000,000—the invoice value.

Mr. MCLAUGHLIN. Annually?

Mr. WHITNEY. Annual importations; yes. But our farmers have paid for that about $20,000,000 annually. This source of supply has been entirely stopped by the embargo placed upon the exportation of potash salts by the German Empire. We have, therefore, only very small shipments and a small source of supply. Canadian wood ashes have given us a little potash, and there is a little potassium nitrate in India that comes into this country. There are a few other small sources of supply in different parts of the world, but they are entirely inadequate to supply the needs for commercial fertilizers. Normally we use about 900,000 tons of potash salts a year.

The CHAIRMAN. Agriculturally?

Mr. WHITNEY. Agriculturally. That supply has been cut off.

The CHAIRMAN. How much is that worth a ton under normal conditions?

Mr. WHITNEY. Of course, that varies. The sulphate of potash under normal conditions is about $62 a ton.

The CHAIRMAN. The different kinds of salts vary in prices?

Mr. WHITNEY. Yes; the actual statement, the declared import value of sulphate of potash, was $36 a ton. The normal retail price was $60 a ton. You see there is a great difference between the import value and the retail price. On December 1, 1915, the retail price had gone to $450 a ton, and it has sold as high as $600 a ton, putting it entirely out of reach for fertilizer.

The CHAIRMAN. That is very true. But this other statement, if I understood you, is that the import value is $36 a ton, while the value to the farmer is $60 a ton normally. Somebody——

Mr. WHITNEY. The invoice value is the value in Germany. That does not count the cost of transportation, the insurance, or the cost of manufacturing in this country.

The CHAIRMAN. In other words, somewhere between the German mine and the farmer somebody gets the difference between $36 and $60 a ton, and that might be made up by the insurance and transportation charges and perhaps some other charges?

Mr. MCLAUGHLIN. A little bit of profit, I suppose, may be added there.

Mr. HOWELL. Do I understand that before it is used here it has to be manufactured over again?

Mr. [illegible]. No sir. A great deal of it is used in making mixed fertilizers, and of course that has to be included, and it all goes in as potash. The declared import value of muriate of potash was $36 a ton. The normal retail price was $45 a ton, and it was selling in December at about $45.50 a ton.

Mr. [illegible]. All those are very prices that are for agricultural purposes.

Mr. [illegible]. Yes sir. No one can afford to pay that price.

Now, the kainit, which is a lower-grade salt—a mixture—has only about 12 per cent of potash. The import value was $4.50 a ton, the cost to consumer was $12 per ton, and the retail price in December and before was from $40 a ton. We have no figures on the [illegible].

Mr. [illegible]. Are they sample sales?

Mr. Whitney. The shipments they get that have not been finally sold are sold in small lots, as a rule.

The Chairman. Now, Dr. Whitney, that brings you up against a very important proposition. In the first place, if we get these various potash salts [illegible] are [illegible]. But the most important fact is that [illegible] at these prices as are given.

Mr. Whitney. Yes sir.

The Chairman. So that we are up against the proposition now of finding some other source of supply. I would like to have you [illegible] would along that line.

Mr. Whitney. Mr. Chairman, there are two possible sources of supply in the United States. Alunite is one. The alunite rock is found in many parts of the country. It is a mineral containing potassium and aluminum. If that is roasted at a temperature of about 700° centigrade, a moderate temperature as chemical industries go, it breaks down into potassium sulphate and alumina. The potassium sulphate can be leached out and recovered as the potassium salt.

Mr. Hayden. What is the expense of such an operation? Is it so expensive that it can not be used for commercial purposes?

Mr. Whitney. It can be used for commercial purposes.

Mr. Hayden. As a matter of fact, two companies are engaged in the manufacture of potassium from this now, I understand?

Mr. Whitney. There are two companies. The difficulties have been rather great. The deposits are in rather inaccessible mountainous places. Railways, tramways have to be constructed. Six or eight miles of rough country have to be overcome before this can be done.

Mr. Hayden. Is there a deposit of any great extent?

Mr. Whitney. The Geological Survey has shown that there are enormous deposits, part of them on the public lands and part of them on privately owned land.

Mr. Hayden. Can this be manufactured at a price that would successfully compete with Germany in normal times?

Mr. Whitney. It is believed so, especially as they have a chance to market the aluminum. The aluminum is left after this roasting process in a form in which it is very useful in the arts, and taking the potash and the aluminum together, this source of supply seems to be a very promising one.

The Chairman. Doctor, is there any effort being made commercially to develop these alunite beds to produce the potassium?

Mr. WHITNEY. There are two companies operating.

The CHAIRMAN. Can you tell us a little about those companies and what promise they give of success?

Mr. WHITNEY. Mr. Chairman, they are just starting. They have not developed their methods or their equipment very thoroughly. I know that they have had difficulties. It is a work that requires expert advice, and they have had difficulties in a number of directions in operating their plants. I would rather not discuss the matter because it would take us into the private affairs of these companies. They are doing the best they can.

Mr. HELGESEN. In saying that this can be manufactured so as to compete with Germany in normal times, have you taken into consideration the disadvantage of a Utah manufacturer, who has to ship his products and pay expensive railroad freights to the East and South as compared with the ocean rates from Europe?

Mr. WHITNEY. Yes, sir; and I believe that the manufacture of potash salts from alunite would not be economical if it were not for the value of the aluminum that is contained. I do not think that the alunite in Utah, with the high freight rates, could compete if it were not for the value of the associated aluminum compounds, but with the aluminum as a by-product, I think the industry can be made to compete successfully.

Mr. HELGESEN. On the Atlantic coast?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. What is your other source of supply?

Mr. WHITNEY. The other source is the giant kelps on the Pacific coast. The kelp plant, as you know, is a water plant that is anchored to the ocean bottom and grows to the surface of the ocean, having ladders to float the leaves. These kelps are entirely different from the sea weeds of the Atlantic Ocean. They are only found in the Japan current, and they extend from the farthest point of Alaska down to the southern point of the United States.

Mr. MCLAUGHLIN. Do you mean to say down to southern California?

Mr. WHITNEY. Yes, down past southern California. Practically all of these plants grow within the 3-mile limit. They grow to a considerable height—60, 70, 90 feet high. The problem is merely to cut the plant about 6 feet below the surface.

Mr. MCLAUGHLIN. How high are they above the surface of the water?

Mr. WHITNEY. They float on the surface. The men go out in a barge having a mowing-machine attachment that cuts about 6 feet below the water, cut the fresh kelp, and pull it up on the barge.

Now, you have a plant that has been growing in the ocean which has the peculiar property of concentrating in itself large quantities of potash, which is present in the ocean in very small amounts; it also concentrates large amounts of iodine, which is present in such small quantities in the ocean that we have not been able to detect it with any sensitive chemical test. This plant, as I say, has the property of being able to concentrate these two things, one of them being potash salts, and it brings this in in such quantities that, when the leaves are allowed to dry in a jar, the potash just falls out, as you can see here. The dust in the bottom of this jar is potassium chloride, which we need to fertilize our fields.

The CHAIRMAN. What percentage of potash [illegible]

Mr. WHITNEY. An average of 16 per cent in the [illegible] I probably it would be better for the committee to hear [illegible] who has charge of this work and who can give the details [illegible] giving you just a sketch.

The CHAIRMAN. I would like to hear a little [illegible] Doctor. You have told us that you have got the giant kelp [illegible] dry condition it contains 16 per cent of potash, and that there is enough of the kelp to run the United States [illegible] as you know.

Mr. WHITNEY. Yes, sir. Kelp needs to be harvested as you [illegible] your other crops. It reproduces itself in about three [illegible] so that in the southern waters, in southern California, [illegible] at least two cuttings a year, while in the northern [illegible] but one harvest.

The CHAIRMAN. We have, then, practically [illegible] supply of potash in this country?

Mr. WHITNEY. If we find some way of making it available, practically.

The CHAIRMAN. Have you any suggestion of a plan by which you can make the potash available?

Mr. MCLAUGHLIN. And what progress is being made in the development of the matter? We were told these same things I don't know how many years ago. What progress is being made?

Mr. WHITNEY. The matter was called to the committee's attention last year. Dr. Cameron discussed it and suggested that it might be desirable to erect an experimental plant to work out the commercial features of harvesting, drying, and preparing this kelp.

Mr. WILLIAMS. Do you think the Government should do this? Don't you think it is an enterprise for private individuals?

Mr. WHITNEY. We have been trying to get private capital interested. There have been two things that have prevented capital from going there. The most serious one is that these beds of kelp are within the three mile limit, are close to the shore, are attached to the submerged lands, and are, therefore, under the control of and belong to the State for the use of the people of the State, and not for any individual until the legislature determines how the people shall use it.

Mr. WILLIAMS. What can the Government do with this proposition unless the legislation is enacted? The Government can do nothing unless the other legislation is enacted.

Mr. WHITNEY. The Government can do nothing as to the control of kelp beds except, perhaps, so far as Alaska is concerned. There the Government can control the use of kelp beds.

Mr. HELGESEN. Do I understand that within this three-mile limit everything is controlled by the State?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. Now, Doctor, I think your proposition last year was that Congress should authorize the department to put up an experimental demonstration plant?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. So as to show to capital that potash from this kelp [illegible] manufactured on a commercial scale. What is your [illegible]

Mr. WHITNEY. At that time, Mr. Chairman, the proposition was manufacture potash in competition with German potash, with phate of potash selling at $60 a ton and with muriate of potash ling at $46 a ton. Now there is no competition—no standard ce. The matter is not at this time controlled by the German sup- at all. We have worked out this proposition on a laboratory sis only. We know what can be done, but we have not worked t the most economical ways of running a factory or what kind of ers or what kind of harvesters to use. We believe a factory demon- ation is necessary in order to ascertain these facts. Capital has t gone in—primarily because they have not been able to get con- l, through leasing or otherwise, of kelp beds. The State has ken no action.

Mr. HELGESON. You have looked up the legal side of this, so as to ow whether the State can give a lease?

Mr. WHITNEY. Yes, sir. The State legislature can do it. They ve absolute control.

Mr. HAUGEN. Can you give any estimate as to the probable cost manufacture?

Mr. WHITNEY. Yes, sir. The proposition that the Secretary has ade in the report on the resolution of the Senate was that it still emed desirable for us to put up a factory for demonstration pur- ses in order to work out the cost of production based on the cost operation—that is, based upon the best way to handle things under ctory methods. We do not know the most economical methods d can not tell until we are so situated as to be able to handle 500 ns of wet kelp a day. When we find out how we can most eco- mically do that, we have solved the problem.

Mr. HOWELL. It has been stated that private capital has engaged this enterprise to a small extent under normal conditions. Have ie changed conditions had no stimulus on this industry?

Mr. WHITNEY. Yes, sir. The Hercules Powder Co. of Wilmington, el., is erecting a plant at San Diego, Cal., for the manufacture of otash salts, but they are going to manufacture potash salts for nmunition and only incidentally to sell as fertilizer refuse that ey can not use for ammunitions. They are going into it for the gh-priced goods. They are not interested in fertilizers.

Mr. HOWELL. Have you any figures as to the amount of potash at is now manufactured from kelp by private enterprise?

Mr. WHITNEY. They are just started. It is reported to me that ie Swift Fertilizer Co., of Chicago, has a part of its factory in actual peration and is sending to Chicago about 30 tons of dry kelp a week. am not sure of this, but that is reported to me. They are manu- cturing some.

Mr. HOWELL. I saw an item in one of our leading papers a day or vo ago saying that it had been discovered that the ashes of the ommon sage brush, which is so abundant, was found to be very rich potash salts. Have you made any investigation along that line?

Mr. WHITNEY. I think it likely. Ashes of that character of vege- ation are generally rich in potash. But the difficulty is the immense olume of material that has to be collected to give you any amount f potash that will have any effect on agriculture. Nine hundred housand tons of potash salts means a large amount of material to 'ork over.

[illegible] sagebrush are rich in po-
[illegible] being absolutely wasted now in clearing
[illegible] from it in the least.
[illegible] sagebrush you as-
[illegible] with your proposition.
[illegible] question? What percentage
[illegible] found in Utah?
[illegible] per cent potash.
[illegible] dry kelp?
[illegible] cheaper?
[illegible] It is just a matter
[illegible] considered. Are the
[illegible] Utah? Are we to under-
[illegible] along to give any
[illegible] salts out of kelp?
[illegible]
[illegible] to give that in detail
[illegible]
[illegible] from Dr. Turrentine.

STATEMENT OF J. W. TURRENTINE, SCIENTIST IN INVESTIGATIONS IN FERTILIZER RESOURCES, BUREAU OF SOILS.

[illegible] comes to giving detailed
[illegible] of potash from kelp, it is
[illegible] We have made a lot of estimates, and
[illegible] We have made no observa-
[illegible] we have made have been
[illegible] processes are in use. For
[illegible] figures of some of the small-scale
[illegible] coast, taking them as
[illegible] harvesting operations and told us
[illegible] We had occasion later to doubt
[illegible] in a position to state what
[illegible]
[illegible] because there you
[illegible] operation, when you get
[illegible] 12 per cent of potash in the
[illegible] of that in the wet stage.
[illegible] the item of harvesting is
[illegible]

Mr. [illegible] way of getting at the cost except
[illegible]

Mr. WHITNEY. [illegible] unless these people will give us their
[illegible] accurate cost data must be based on the
[illegible] of a plant in the most intelligent manner.

Mr. WHITNEY. Somebody must work it out. Any estimate we
[illegible] would be nothing more than guesswork.

Dr. TURRENTINE. The figures that seem to us most probable are cents a raw ton for harvesting.
Mr. HAUGEN. How many raw tons is required to make a ton of tash?
Dr. TURRENTINE. If the kelp contains 90 per cent of water, as ne kelps do on being taken from the water, and it is dried down zero, so that it has no water, then it will take 10 to 1. If it cons 85 per cent water, as a good many samples indicate, and you y it down to 10 per cent, it should take about, I should think, 6 1—something like that.
Mr. HAUGEN. Let him carry this out.
Dr. TURRENTINE. Then, the cost of harvesting, calculating to a dry sis, would be, on the basis of 15 cents a ton if you dry it from 90 to ro, $1.50. If you dry it from 85 to 10, it would be something in the ighborhood of 90 cents for harvesting. Now we know more about ying, because material is being dried every day in various indus- es. We have calculated that the drying is going to cost in the ighborhood of $1.38 a dry ton, or 23 cents a wet ton.
Mr. HAUGEN. $1.50 or 90 cents.
The CHAIRMAN. What else is there to consider in the cost of manucturing?
Dr. TURRENTINE. If you are going to sell dry kelp—that is, if you e going to sell kelp with the potash in——
The CHAIRMAN. We want to get it out; we want to get it out in ape for our farmers to use it.
Dr. TURRENTINE. The farmer can use it in the kelp.
Mr. MCLAUGHLIN. Seaweed is used in some of the Eastern States fertilizer.
Dr. TURRENTINE. There is nothing in the kelp, so far as we know, at would make it injurious as a fertilizer. On the other hand, there e other ingredients in the kelp which would make it valuable; for stance, the dried kelp contains about 2 per cent of nitrogen.
Mr. HAUGEN. But you are omitting the freight.
Mr. MCLAUGHLIN. He has tried to tell you that there is something sides the 16 per cent of potash; that there is 2 per cent of nitrogen. iat would be worth $5 or $6 a ton to the farmer.
Mr. HAUGEN. Do you suggest using the dry kelp or making it into otash?
Dr. TURRENTINE. I would suggest doing both. As the first operion I would suggest a preparation of dry kelp on as large a scale possible.
Mr. WHITNEY. That is the quickest.
Dr. TURRENTINE. Methods are being worked out for the extraction the potash salts. There would be an advantage in that on account freight rates.
Mr. HAWLEY. Does the application of dry kelp to the land serve ie same purpose as putting potash on it, or is it more useful?
The CHAIRMAN. On account of the nitrogen in it?
Mr. WHITNEY. The dried kelp would be more useful to the farmer ian to the mixer. It would be more difficult for the latter to make ie desired mixtures.
Mr. HAWLEY. I was thinking from the farmer's standpoint.
Mr. HAUGEN. Would you suggest grinding it?
Mr. WHITNEY. Yes; that would be all right.

Mr. HELGESEN. Would the stems have a certain value in addition to the leaves?

Dr. TURRENTINE. Yes, but it would be a very small amount of organic matter. When it swells up it would hold moisture and would be of value.

Mr. HELGESEN. Whether or not it could be used in the original state would depend on freight and handling, I suppose?

Dr. TURRENTINE. There is also the question of whether you would get by on costs. We have investigated systematically the matter of getting by on duties.

Mr. HELGESEN. If the freight rate is low enough, you could handle it in the original state.

Mr. HAUGEN. What is the freight from ocean to ocean?

The CHAIRMAN. You have got the harvesting and drying.

Mr. HAUGEN. The harvesting and drying costs 38 cents a ton, wet, and it takes 6 tons wet to make 1 ton dry, which makes $2.28. Now the freight rate.

Mr. WHITNEY. Freight rates under normal conditions are $5 a ton by way of the Panama Canal. That makes the cost $7.28 a dry ton.

Mr. HAUGEN. What have you got after you have dried it?

Dr. TURRENTINE. You have a basic fertilizer of 15 per cent K_2O, or 25 per cent potassium chloride. That compares favorably with the German salts. Some of the German salts carry only 12 per cent. Then you have nitrogen. We have 2 per cent of nitrogen, worth $5 or $6.

The CHAIRMAN. You are the teacher now, and we are the pupils. You want to deal with us as kindergarteners. What we want to know is what it is going to cost to manufacture a ton of potash that is used ordinarily by the farmer for fertilizer out of this giant kelp. First, you have got your harvesting, then your drying, and then there are some other manufacturing processes in there somewhere. Now go on and tell us.

Dr. TURRENTINE. There is the cost of grinding and packing, if you are going to ship in sacks. I have got those figures somewhere, Mr. Chairman, but I haven't got them in my head.

The CHAIRMAN. We will ask you to put them in the record.

Mr. HELGESEN. Put in the cost of producing the dried kelp itself and then the cost of manufacturing the potash salts from this dried kelp.

The CHAIRMAN. Please also furnish similar figures with reference to the alunite.

Mr. HELGESEN. Why not have the information now?

The CHAIRMAN. He doesn't have the figures, he says.

Mr. WHITNEY. Mr. Chairman, we can give you figures, but they will necessarily have to be mere crude approximations. The only thing that we can say is that, in our judgment, potash salts can be prepared from kelp to come within the cost of the German salts when they are delivered in New York. However, it may be a little more with our present methods of operation. As already stated, we believe we can meet competition of German salts on the Atlantic coast. But it would be impossible for us to determine the cost of operation and arrive at a dependable figure until we have experimented ourselves on a factory basis. Considering the cost of han-

material of this kind in other lines of commercial industries, lieve it can be produced to meet competition with the German
At the present time, however, we have no competition with an salts. Our best estimate is that it will cost between $7.50 10 a ton.
CHAIRMAN. When you reach a conclusion in your mind that an manufacture potash laid down on the Atlantic coast in com- on with Germany, you have evidently had some series of facts led to that conclusion. Now, if you will put this in the record, ommittee will make up its mind whether it agrees with that or
HAUGEN. What we are trying to get at is the cost of producing articular product. What is the use of having these hearings aving these gentlemen appear? If these gentlemen are not red now to answer the questions let them get the data and appear the committee again.
WILSON. I think the fact is that the committee is responsible e situation. Congress has so far refused money to be used by hitney and those associated with him to get more or less accu- gures, and he tells you now, and you can see the reasons for it, hese figures are more or less a speculation. But we would like enefit of his best judgment, as a result of all the investigation s been able to make.
HAUGEN. I am not criticizing your bureau. But the gentle- tarted to give us an estimate of the cost, and it seems that he to conclude and give us some estimate. We have spent half ur and got nothing.
WHITNEY. We have not the figures, for the reason I have stated. n give you estimates.
STEELE. The young man stated what information they have . He did not think it was the right kind of information. It npossible to get from those people who manufactured these salts rrect data; so you have no way of finding that out. How long wift & Co. been shipping 30 tons a week to Chicago?
WHITNEY. They began about the first of this year. They get into operation there until about the 1st of January. They made only the first shipment.
STEELE. Then, on the account of the war it was impossible for to get the salts, but now they are getting it out of kelp?
WHITNEY. But they have not completed their plant yet.
STEELE. There is another question I would like to ask you. and the Pacific coast are the only two places that your survey tes that you can get these salts? Is that true?
WHITNEY. You are including the alunite?
STEELE. Yes; alunite in one place and kelp in the other place?
WHITNEY. Yes; that is all.
STEELE. Your investigations show that these are the only two in which you can get potash?
WILSON. From whom do Swift & Co. purchase this kelp?
WHITNEY. They go out and take it. It is free to anyone.
ANDERSON. Have you any idea how large an investment would olved in building a plant that would manufacture 900,000 tons ash annually?

Mr. WHITNEY. We ask $100,000 for a plant. We ask for $50,000 additional to equip that factory, so that we can use the whole thing for producing potash salts, or we can use the whole thing for producing nitrogen products and other things. We ask a total of $150,000 for a commercial plant.

The CHAIRMAN. Now let us see if you did ask for that. Your statement a moment ago was to the effect that, if there has been any dereliction, it is the dereliction of the committee. You say that you are asking for $150,000?

Mr. WHITNEY. The Secretary has proposed that to the Senate.

The CHAIRMAN. As a matter of fact, have you ever asked this committee for this demonstration plant?

Mr. WHITNEY. Not officially.

The CHAIRMAN. I have here myself the only statement made before this committee in reference to this matter. In the hearing before the committee on the bill for the fiscal year 1916, that is this fiscal year, Dr. Cameron said:

Dr. CAMERON. If Congress thought it desirable, I do not think there is any question but that we could in six months or, say a year, determine the best method of extracting potash from kelp in a commercial way. That it can be done chemically has been shown; that it can be done commercially has been shown; and it is the policy of the department to tell people so when they inquire about it and then let them go out and try it out themselves. But with the emergency that is upon us my own personal idea (I am not speaking for my official superiors in this) is that it will be necessary to go out there and show those people just how to do it. Now, in order to be effective, that would have to be done on at least a semifactory scale.

The CHAIRMAN. In that connection will you tell us just what you mean by a semifactory scale; what would it cost; how would you do it, and where would you do it?

Dr. CAMERON. I should go out to southern California and put up the best kiln that I was able to build, and burn kelp; I should try burning the dried kelp and I should try burning the wet kelp; I should see whether I could recover ammonia or other products in the process. I am pretty well convinced that it would take some $15,000 or $20,000 to carry on the preliminary experiments, which could be satisfactorily finished in five or six months.

I should then, on the basis of those experiments, put up a plant to handle 400 tons of wet kelp a day, as that is about the amount the best harvesters that have been used out there can cut in a day. A plant handling that amount of kelp would cost anywhere from $30,000 to $60,000. I think a fair estimate would be about $60,000; that is, not only to build the plant, but to carry it on for about a year.

In his statement before the committee for the fiscal year 1915, Dr. Cameron, in answer to some of my questions as to the cost of producing this potash from kelp, said:

The CHAIRMAN. Have you formed any opinion as to the relative cost of producing potash from the kelp beds as compared with the cost of this product as taken from the potash beds of Germany?

Dr. CAMERON. It would be very much cheaper from the potash-bearing kelps on the Pacific coast. It is very much easier to handle.

The CHAIRMAN. Would you be able to ship your goods from the Pacific coast, either by rail or by way of the Panama Canal, all the way around to the Atlantic coast and do it cheaper than they could ship from abroad.

Dr. CAMERON. By sea transportation, I should say yes; but by rail, I doubt it.

The CHAIRMAN. Have you figured how much that would amount to?

Dr. CAMERON. Yes, sir.

The CHAIRMAN. How much?

Dr. CAMERON. It will cost to manufacture the material, the dried kelp, which would compete with the mineral salts of Germany, and to ship it around to Charleston, something like $9.50 a ton.

The CHAIRMAN. Less than the German?

Dr. CAMERON. No.

Dr. MARBUT. Do you mean the whole cost?

[illegible]

[illegible]

[illegible]

Mr. WHITNEY. They are putting in investments where they are ire they are going to get back the whole thing. That is what they) now. They expect to pay for the whole thing in a short time.

Mr. HELGESEN. There would be no excuse for making an appro- iation now unless their plants are merely temporary in character id not handled in the best scientific way; but, in the latter event id if you are going into it scientifically, I can see perhaps where you ay be justified in experimentation.

The CHAIRMAN. There would be no excuse for going into this atter if we shall have in the meantime developed a system by iich we can control our own potash situation. Under these normal prices now anybody can manufacture potash and make a ofit.

Mr. WHITNEY. It is the opinion of our experts that we can have ch a supply, but they hesitate to say definitely until they have had chance to work it out commercially.

Mr. OVERMYER. But, in the meantime, the farmers of this country ll have to do without potash.

Mr. WHITNEY. Yes, sir.

Mr. HAWLEY. Since I came to Washington I have seen in some of e Western papers a statement to the effect that there have been und beds of fertilizer of great extent. Has anything concerning at come to your attention?

Mr. WHITNEY. Where?

Mr. HAWLEY. Eastern Oregon, Lake County.

Mr. WHITNEY. No. We get a great many reports of that kind. 'e trace them down and find most of them to be baseless. Some of iem have a little something in them.

Mr. ANDERSON. As I understood the statement of Dr. Cameron, hich the chairman read a few minutes ago, he estimated that the ost of an experimental plant would be about $60,000. I understand iat your estimate is $150,000.

Mr. WHITNEY. Our estimate is $100,000 for the plant that he asked or then, but our estimate is based on present prices. Everything is iore expensive; the steel, the electrical equipment, etc., would be iore expensive than it was then, and it would take us longer to get it.

Mr. ANDERSON. If my recollection is correct, the estimate of $60,000 y Dr. Cameron included everything which would be included in our estimate of $150,000. He estimated that from $15,000 to 20,000 would be required to make the preliminary experiment.

Mr. WHITNEY. And then $60,000 to erect the plant.

Mr. ANDERSON. No; he says a plant to take care of 400 tons of kelp would cost anywhere from $30,000 to $60,000, and he says a air estimate would be about $60,000. Now, what is there in addi- ion that is not included in his $60,000 which is included in your $150,000?

Mr. WHITNEY. We propose doing all at one time what he proposed to do by steps. He proposed to spend $20,000 on experiments first, to see what kind of a factory to put up, and then put up a factory; and we ask for a factory equipped so that we can work the whole plant for a period of time for the production of dry kelp, second, for the production of salt, and then for the production of by-products. So our proposal is to do at one time what Dr. Cameron proposed to do more cheaply in a series of acts. It would cost us more to do this

[illegible]

Mr. CRISP. Is there anything further in the [illegible] Mr. WHITE. Mr. Chairman, the [illegible] We are still going to have [illegible] The United States has the largest supply of [illegible] in the world. But to make that available for the farmer [illegible] superphosphate. We have only a limited supply of sulphuric acid and phosphate rock, and we can not better manipulate them [illegible] two tons of superphosphate.

Now, the phosphate rock is cheap. It has not increased in value. The price has come down because the demand is less. Exports have been cut off largely. So the price of phosphate rock is very low, but the demand for sulphuric acid for munition purposes has become so great that the price has increased from $5 to $6 a ton under normal conditions to $15 and $30 at the present time. That has gone up about one-third, and the increased cost of sulphuric acid, which is such an important factor in the preparation of superphosphates, has made it more profitable to sell the sulphuric acid than to manufacture superphosphates for fertilizers. While they are trying to increase their production of sulphuric acid they have been working their factories to the limit. They have repaired some of their old factories that were out of commission and yet have not kept pace with the demand for sulphuric acid.

Mr. HUTCHESON. What is sulphuric acid made out of?

Mr. WHITE of Ohio. It is made out of pyrites by oxidizing in lead chambers the sulphur fumes that come off. A sulphuric-acid plant requires a costly thing—investment and installation.

Mr. HUTCHESON. And yet the method must be cheap.

Mr. WHITE of Ohio. It is cheap because they produce it in such large quantities. We use approximately 2,000,000 tons of sulphuric acid for the preparation of our fertilizers. Now, the current prices quoted for superphosphates are from 50 to 100 per cent over normal. The chance is that acid phosphate, which cost just about twice as much in 1910 as it did in 1913, is going to prevent to a very large extent the use of superphosphate, and, as we use 4,000,000 tons of superphosphate, the contraction in the amount of superphosphate that is going to be used is going to have a serious effect on agriculture.

Among the ways of relieving the situation with regard to phosphates which we have considered is this: There is a possibility of increasing the amount of sulphuric acid, particularly with sulphuric fumes, in the West. But it involves a very costly installation of the lead chambers, and because under normal conditions there is no sale for the sulphuric acid, they are loath to go to the expense of installing plants of this kind. We have in the West and South, but particularly in the West, vast quantities of phosphate rock. The western phosphates are so situated with respect to transportation that there seems to be no way of utilizing them for fertilizers unless they make a more concentrated fertilizer than we have been accustomed to use. There is a process by which they treat the phosphate rock with an excess of [illegible] acid and get out the phosphoric acid, with which they [illegible] rock, thus making a double superphosphate. The

ordinary superphosphate has from 14 to 18 per cent of soluble phosphoric acid. But this double superphosphate contains from 40 to 45 per cent of phosphoric acid.

That would probably stand the cost of transportation from the western phosphate fields. But the use of sulphuric acid is after all illogical. When we use sulphuric acid to free the phosphoric acid in our rock, we at the same time produce a large amount of gypsum, which is entirely useless. We can't sell it but we have to pay transportation. With the modern methods of electrochemical work, it has been shown to be perfectly possible with cheap water power to take the phosphate rock, put it into an electrical furnace, and distill off the phosphoric acid there. We thus get phosphoric acid free from sulphuric acid or from lime. Phosphoric acid is a very difficult thing to transport. In its acid form it has to be transported in tank cars and in dilute solutions. But, if we can get at the same time nitrogen products from the air fixed in this same electrical furnace that we use for the distillation of phosphoric acid and then combine the electrically fixed nitrogen with our phosphoric acid in the form of ammonium phosphate, then we have a carrier for our phosphoric acid which has a value four times as great as that of the phosphoric acid, instead of having the lime and the gypsum as a carrier in this double superphosphate, which has no value whatever. Now, the preparation of high-grade ammonium phosphate and the use of potash salts from the alunite deposits in Utah right close to the phosphate fields and the manufacture of potassium phosphate and ammonium phosphate would give us the most concentrated form in which we could possibly have our fertilizers, and that would stand the transportation without question.

The CHAIRMAN. Any questions on that line?

What have you done with reference to the small item you put in the bill last year for an experimental nitrogen-fixing plant at Arlington?

Mr. WHITNEY. We have the building up. We have the equipment, except one of the furnaces, which we have been delayed in getting because of the inability of the steel manufacturers to deliver it. We have been waiting several months for it and have only been recently informed that it is now on its way.

We have, however, constructed a small furnace, which we are working now, and it has satisfied us that this method of relieving the situation with regard to phosphates is perfectly feasible and economical, provided there is cheap water power, which we think we can get—in fact, have reason to know that we can get—in association with the western phosphate fields. It is the Secretary's purpose to send in this Document No. 262, recommending that, under the emergency caused in the fertilizer trade, an experimental factory be put up for the preparation on a small commercial scale of phosphoric acid, ammonium phosphate, and potassium phosphate from these western fields, provided we can make some sort of arrangement with the owners of the patents having control of the nitrogen-fixing systems whereby they will grant us permission under some arrangement to use the electric fixation, unless we ourselves in that time can obviate the necessity of working under these patents by perfecting a system that we now have under study.

Mr. HELGESEN. Are those patents foreign or domestic?

[illegible] world patents.

[illegible]

[illegible] they are Norwegian [illegible]

[illegible] Norwegians are suffering from [illegible] same thing [illegible] those plants that will [illegible] highly profitable [illegible] which will be [illegible] eight years. In [illegible] being prepared at this [illegible]

[illegible] taken up it is [illegible] with [illegible] What [illegible] Department [illegible] taken it up [illegible] to this report to Congress there be [illegible] some arrangement be entered into [illegible] the [illegible] relation to the manufacture of explosives.

Mr. WHITNEY. Yes, sir; we have that under consideration now. We are [illegible] by the patents from using this [illegible] of [illegible] but [illegible] ammonia from [illegible] and combining that with [illegible] phosphoric acid as a means of getting it into an available form. Here [illegible], is a sample of potassium ammonium [illegible] the most concentrated form of fertilizer that is known. It has all the fertilizing constituents, and there is nothing there that does not carry its own cost of transportation.

Mr. SANDERSON. What is the cost of that? Is that sold in the market?

Mr. WHITNEY. No, sir. That is our own preparation.

Mr. HEPBURN. Could that be produced at a cost that the farmers could afford to pay?

Mr. WHITNEY. We think so.

Mr. HEPBURN. Can you continue your experiment on your regular appropriation, or have you asked for something special?

Mr. WHITNEY. We can not do anything in the field with the appropriation that we now have.

Mr. HEPBURN. Do you think it would be necessary to go into the field?

Mr. WHITNEY. We believe that is the only way to get it started.

Mr. HEPBURN. Has the Senate now got that proposition before them?

Mr. WHITNEY. Yes, sir.

Mr. HEPBURN. What is the number of that document?

Mr. WHITNEY. No. 962.

STATEMENT OF MR. CURTIS F. MARBUT, SCIENTIST IN CHARGE OF SOIL SURVEY, BUREAU OF SOILS.

The CHAIRMAN. Take up item 31, for soil surveys. Tell us briefly what you are doing, what is the increase asked, and the purpose of the increase.

Mr. MARBUT. In the first place, we are defining what soil is. In the second place, we are going over the United States in a very detailed way, on every 10 acres, and determining what soil is in any particular spot. We are making a soil survey. We had to make first our definition of what a soil is, and then, after we had determined what [illegible] we had to find what soil is in a particular spot. That, in short, is a soil survey is.

Mr. ANDERSON. What are you doing it for?

Mr. MARBUT. For the farmer and for other people who help to pay for it.

Mr. ANDERSON. I will ask the question that I asked awhile ago. Supposing a farmer wrote to your bureau, sending in a sample of soil, and let us assume that you have made a soil survey including his farm; what information can you give him that would be of practical value?

Mr. MARBUT. We can do this: We know, in the first place, the texture of the soil on his farm. It has been known for a hundred years that certain textures of soil are best adapted to certain kinds of crops, that certain textures of soil make differences in yield of crop, and that certain textures of soil have influence on the method and cost of farm operations.

Mr. HELGESEN. The complaint has been made, whether it is justified or not, that if you consult a soil expert he will tell you all about the character of the soil on your farm, but when you ask him what we should grow he says, "That is not my business. You will have to send for a man from the Bureau of Plant Industry."

Mr. MARBUT. The man is one factor in crop production, the climate another, and the soil another. In the organization of the Department of Agriculture the Bureau of Soils deals with the soil. It is absolutely impossible for a man who deals with only one factor in crop production to tell just exactly all about crop production.

Mr. HELGESEN. That may be true to a certain extent, but with the ordinary crop it seems to me that, as you know the climate, a man should be able to get from you some general information without being referred to another man.

Mr. MARBUT. But the farmer is apt to demand some special information. It is true that the soil man can give some general information, but in as large an organization as the Department of Agriculture it is not really expected that one bureau should give advice for all sorts of things.

Mr. MCLAUGHLIN. In any of these soil surveys, do you determine the amount of plant food, if I use that expression correctly—the amount of potassium, phosphates, nitrogen, and so on, in the soil?

Mr. MARBUT. Relatively, yes. We are doing now all that we have done in the past, yet it is not true that we make a chemical analysis of every soil. If we undertook to make a chemical analysis of every soil in every county, the cost of a soil survey would be increased many times. We are making the soil survey to find out what we can as quickly and as cheaply as possible, and as time goes on we will be accumulating chemical data. We do, however, determine relatively the proportion of plant food in the soil. It is known that soils that have been leached are low in plant food and that in those soils the various kinds of plant foods, other things being equal, have gone out in a certain proportion by leaching. Now, by our soil survey we do determine whether a soil has been thoroughly leached or not, basing the determination on the character of the soil with respect to its content of lime. Lime is one of the most easily dissolved of the soil constituents, and if a soil has a great deal of lime in it, we know that it has not been leached. So to that extent we are determining the amount of plant food in the soil.

Mr. [illegible]. When you make the soil survey of a county and [illegible] of your report is written, is one who [illegible] whether or not his soil needs lime, whether or not it [illegible] or whether or not it needs phosphorus, and if so, how?

Mr. [illegible]. The soil-survey report always states the practice of [illegible] soil survey, of course, states whether it is red [illegible] with the proper interpretation, the [illegible] requirements of his soil.

Mr. [illegible]. What do you mean?

Mr. [illegible]. With the proper interpretation of the relation of lime [illegible] whether he should use [illegible]. The reports do not state that a [illegible]. They do state the practice of the region, [illegible] with the data concerning the stage of leach- [illegible] conclusions as to the use of fertilizer.

Mr. [illegible]. What value has the soil survey been to one who [illegible] of his soil?

Mr. [illegible]. The value of the soil survey lies in the fact that it [illegible]. We give it a name, and that name [illegible] any other technical word. It has [illegible].

Mr. [illegible]. What translates that?

Mr. [illegible]. What translates it is our definition of what that name [illegible] soil survey report the name is defined in terms of [illegible].

Mr. [illegible]. Does the description contain information that [illegible]?

Mr. [illegible]. Yes.

Mr. [illegible]. As to the amount of lime or the amount of [illegible]?

Mr. [illegible]. If you found the exact percentage of phosphorus and [illegible] that was high in those constituents, [illegible].

Mr. McLAUGHLIN. I have not seen such a report as that.

Mr. MARBUT. I have one of the recent reports here. I could show you what we mean by describing the character of the soil. Where there is the specific statement as to the lime content, the lime is low. Where the description states that the soil effervesces in hydrochloric acid the soil is high in its lime content, and there is therefore, according to our experience, relatively high content of the other soluble salts.

Mr. McLAUGHLIN. You will give the soil a name, but are not different soils of the same name radically different?

Mr. MARBUT. No, sir.

Mr. McLAUGHLIN. They are radically different in their plant-food constituents, are they not?

Mr. MARBUT. No, sir.

Mr. McLAUGHLIN. Do you mean to say that an entire area of a certain kind of soil is alike fertile?

Mr. MARBUT. Yes, sir.

Mr. [illegible]. When you make this survey and furnish the map, if a man [illegible] specific information as to what would best grow on [illegible] may [illegible] and, or red land, by writing to the Bureau of Plant

dustry and telling them what the character of his soil is, could he t information as to what crops would best grow on it?

Mr. MARBUT. He could get the information as far as they know it.

Mr. HEFLIN. So the soil survey is a great advantage to the farmer. e found there were two kinds of land in Alabama that we did not ow would grow tobacco. This soil survey shows that it could be done.

Mr. MARBUT. The soil survey finds locally where a certain crop is own and grows well, and experience shows that wherever that same il exists, other things being equal, it will produce that crop. The il survey determines the distribution of that soil.

Mr. HAUGEN. Is it necessary to send a sample and have it analyzed?

Mr. MARBUT. Not if the county in which the farm is located has en covered by a detailed soil survey.

Mr. HAUGEN. I understand you go over every 40-acre tract in aking a survey?

Mr. MARBUT. Yes, sir. I might say that we are doing a little more tailed work now than we did in the beginning. But it was the tention to make detailed soil surveys from the very beginning. To ake a soil survey, it is necessary to see the soil in place, and to see it place it is necessary to go over every 40-acre tract.

Mr. HAUGEN. Do I understand that you take samples of every)-acre tract?

Mr. MARBUT. No, sir. We examine the soil on every 40-acre tract, ie way or another, but we do not collect a sample from each tract.

Mr. STEELE. If I have 40 acres you give me an abstract of what it ntains?

Mr. MARBUT. The soil map will show by means of colors the differ- t kinds of soil, or your whole 40 acres may consist of one soil.

Mr. STEELE. Then you tell me it is adapted to certain plant life?

Mr. MARBUT. Yes, in so far as we know or can reasonably infer on ie basis of our knowledge of that soil throughout its whole area of currence.

Mr. MCLAUGHLIN. They will tell you that that soil is suitable for rtain crops if you have the ordinary amount of plant food in it, t so far as I have seen there is nothing in a report as to whether not a piece of soil contains any particular amount of plant food.

Mr. MARBUT. That is true. There is no statement that it contains, y, 0.06 per cent, or 5 per cent, or 80 per cent, but there is a per- tly definite statement in our most recent reports that it is high in luble matter or low in soluble matter, and that is a pretty fair dication, if you look at it with the proper interpretation. The bsence of lime shows extensive leaching, and if the lime has not en leached out the other things have not gone.

Mr. MCLAUGHLIN. Do you mean that if a soil lacks lime it means ecessarily that it lacks potash?

Mr. MARBUT. The soil that lacks lime will, other things being qual, lack soluble potash.

Mr. MCLAUGHLIN. Then, if lime is added, it will not be necessary supply potash?

Mr. MARBUT. That does not follow at all. The addition of lime ill not increase the total amount of potash in the soil.

The CHAIRMAN. What do you mean? If a soil is low in potash nd you add lime, will that increase the potash?

Mr. MARBUT. No, sir.

The CHAIRMAN. I wanted you to make that clear.

[illegible] Now let us see what we can get out of this chart. [illegible] Mr. Hill, the ratio [illegible] the New [illegible] great many experiments in the laboratory at [illegible] has a chemist take a sample of the soil which [illegible] what it lacks. He determines what is to [illegible] in order to increase the crops that are raised. [illegible] increases the crops 50 per cent and sometimes [illegible] New [illegible] soil survey of a county and you find that [illegible] elements either naturally or through a long series [illegible] going to go to in a case of that kind to find [illegible] the soil needs and in what quantities, and [illegible] will be to increase these crops as he has [illegible] as high as 50 per cent or more?

Mr. [illegible] answer that question indirectly. Mr. Hill [illegible] certain spot, by means of experiments carried [illegible] soil under a particular treatment will produce [illegible] we make a soil survey of the tract on which the [illegible] determine the soil type, then determine the [illegible] other counties or in other States, we can [illegible] experiments and the survey that that soil will [illegible] conditions.

[illegible] have some of that land. It is low [illegible] tell me what elements to put in, how [illegible] the results?

Mr. [illegible] experiments have shown certain results at one [illegible] tell you what to expect on the same [illegible] other conditions which control or affect [illegible] soil. We can also tell you whether you [illegible].

[illegible] have made the soil survey?

Mr. [illegible]

[illegible] get it through you or some other [illegible]

Mr. [illegible] undertake to give in our soil-survey [illegible] all the experiments that have been made [illegible].

[illegible] anybody in the Agricultural Department [illegible] answer to that?

Mr. [illegible] I must say, Mr. Chairman, that I can not state [illegible] can be obtained in the department or not.

Mr. [illegible] Do you know whether there is any cooperation [illegible] other bureaus which would make such [illegible]?

Mr. [illegible] This work of experimenting on soils and soil types [illegible] all over the country. The experiment stations in all the States have experiments going on. The State departments of agriculture have experiments. There are all sorts of agencies, besides the department conducting investigations to determine the best methods of handling the soils, the proper kinds of seeds to use, the fertilizers, and everything connected with farm management. The whole country is alive with experiments of that kind at the present time. Now, it is the consensus of opinion the world over—and it was recently so expressed by the director of the Rothamstead experiment station in England, where they have been experimenting on the chemical nature of soils for 70 years—that the safest thing to do in determining the

equirements or the suitability of a sample of soil from another locality s to visit the ground and personally examine it, unless you have a soil survey as the basis. If they know the type of soil and the results of experiments that have been made on that type of soil, then it is safe to say that under similar conditions of climate that type of soil should produce in this place what it has produced in another place.

The soil survey is laying that broad foundation, and we are all of us the world over more and more depending on the accumulated knowledge of soil types and their peculiarities. The type of soil to us is just like the type of an animal. It produces certain things. It responds in a certain way to cultivation, to fertilization, and that is giving us the basis for the best intensive system of agriculture.

Mr. STEELE. Mr. Helgesen is right. When you have made a survey of my 40 acres, you know the character of the soil. Now, I, as owner of that farm, who have paid my share of the expense of having it surveyed, should have an abstract or something to tell me what to do to increase the crops.

Mr. WHITNEY. You have it in the soil survey. We give that advice in the soil survey, tell you the type of agriculture you ought to maintain on it, the character of the crops, and the way the agriculture should be carried on.

Mr. ANDERSON. I am interested in seeing one of those bulletins.

Mr. MCLAUGHLIN. Is this true, that as the result of your survey you may find a great area of soil to which you give the same name which in reality differs radically in crop-bearing power in different parts of the area?

Mr. MARBUT. Allow me to defer that question for a moment. (To Mr. Helgesen) Prof. Whitney has saved the day for me.

Mr. HELGESEN. I am not so sure that he has.

Mr. MARBUT. Yes; he has. He has reminded me that we are cooperating with the States. The States carry on experiments on the soil types after the soil survey has covered a particular locality. After we have cooperated in the making of the soil survey, or after we make it without cooperation, they determine the best methods of handling the soils. Now, when you want to know those definite things, as a rule, you have to apply to the State experiment stations. So far as I know, there is no bureau in the Department of Agriculture that does it like the State experiment stations. There is no such close cooperation between the Bureau of Soils and the other bureaus as there is between the Bureau of Soils and the experiment stations.

Mr. WHITNEY. That is because the State is vitally interested in the results in that section. As soon as they get our survey they work on it because they are vitally interested.

Mr. HELGESEN. And yet they haven't done that work.

Mr. WHITNEY. They are doing it all the time.

Mr. MARBUT. May I make another statement? You know the United States is big, and each State is big, and the soil survey was started only 10 years ago or such a matter. Well, it takes two men about six months to survey an ordinary county of 500 or 600 square miles. We have a permanent field force of about 50 men. The rate of progress, therefore, is bound to be slow. In the same way the forces of the States have to go slow because they are limited in the number of men and the amount of their resources, so that it does not mean that we have got yet by any means the results that we expect. We have just started.

Mr. [illegible] desirable. You have told me the type of [illegible] what it contains.

Mr. [illegible] has also told you what it contains. He has [illegible] the soil. It may be those acres are composed [illegible] content ordinarily expected in that [illegible] same. It may be good, bad, or indifferent [illegible] able to see absolutely no information [illegible] that soil. Now, if I am wrong I [illegible] to be corrected.

Mr. [illegible] soil survey gives the soil a name and describes [illegible] fertility, whether that be due to excellent [illegible] chemical character, or to both excellent [illegible] character.

Mr. [illegible] can take a sample of soil and send it to the [illegible] and they will tell you what pro[illegible] and phosphorus is in there and suggest [illegible] can be added. But you get absolutely [illegible] from the soil survey.

Mr. [illegible] very helpful information?

Mr. [illegible] is that you could not get it with the [illegible]

Mr. [illegible] question? Suppose a sample is taken [illegible] analysis determines that there is 5 per [illegible] does that mean 5 per cent of potash for [illegible] from which the sample was taken.

Mr. [illegible]

Mr. [illegible] going to determine whether the soil at [illegible] the rest of the field? You can determine it [illegible]

Mr. [illegible] Does your survey determine whether the field [illegible]

Mr. [illegible] Yes.

Mr. [illegible] I desired to take a sample of soil and send it [illegible] how would you advise it to be done?

Mr. [illegible] the same way that we take samples; use a soil [illegible] get the surface sample, then the subsurface, and then the [illegible]

Mr. [illegible] Should it remain in the same position?

Mr. [illegible] No, but you should send the different layers in separate packages.

Mr. [illegible] How deep should I go for each one?

Mr. [illegible] Down to change of color for the surface soil, and to change of texture or color for the subsurface.

Mr. [illegible] How do you proceed where you have four or six feet of black loam?

Mr. [illegible] I would take it all in one sample in that case.

Mr. [illegible] Does not the soil survey show four or five different soils in a county?

Mr. [illegible] Yes, sir. In fact, Mr. Chairman, it is an extremely rare thing to find a county that contains less than 30 soil types.

The [illegible] I hold in my hand a soil report. It says, speaking of the [illegible] sandy loam:

This is [illegible] nearest soils in Orangeburg County. It is a soil suitable to a wide [illegible] at present planted principally to corn, cotton, and oats. [illegible] cotton, one-half bale to 1½ bales per acre. Corn and oats do well.

n small areas alfalfa is doing well. Vetch and crimson clover are grown with varying egrees of success. Large yields of cowpea hay are obtained. The farmers who prac- ce deep plowing in the preparation of the seed bed for all crops have found it very ffective in increasing yields.

This soil is well suited to the growing of cantaloupes, as shown by actual experience n some adjoining counties, although very little of it is used for that purpose in Orange- urg County. The lighter phases may be used for peach growing, and there are many cres well suited to the location of orchards.

Usually applications of 600 to 1,000 pounds of commercial fertilizer are used in rowing corn and cotton.

Practically all of the Orangeburg sandy loam is under cultivation. The value of he land varies according to its condition and its location with respect to the larger owns. Small fields near Orangeburg bring as much as $125 an acre. The usual rice, however, throughout the county is $60 to $100 an acre. Not much of this type s for sale at any price.

Is that about typical of your statements?

Mr. MARBUT. That is typical. The series description includes a ittle more, as a rule.

Mr. MCLAUGHLIN. There is just one thing. The statement is nade that usually so many hundred pounds of fertilizer is added?

Mr. MARBUT. Yes.

Mr. MCLAUGHLIN. Has anyone in that county of which you speak given information as to whether or not that particular kind of fertilizer was necessary, or whether of not there is some other kind of fertilizer hat is needed and might be used with better effect and more profit?

Mr. MARBUT. No, sir. When that survey was made no actual xperiments had been made with fertilizer on that soil type. Any umber of chemical analyses would not have shown what combina- ions of the various fertilizing elements would give highest yields.

The CHAIRMAN. In reference to fertilizer, I happened to notice his statement with reference to the Orangeburg fine sandy loam:

The texture of the Orangeburg fine sandy loam enables it to hold moisture well, naking it an excellent soil for the general farm crops. It is planted to corn, cotton, ats, cowpeas, vetch, and soy beans. Cotton produces from two-thirds of a bale to 1¼ bales, corn from 15 to 30 bushels, and oats from 25 to 50 bushels per acre. Appli- ations of about 600 pounds per acre of commercial fertilizer, usually analyzing 8–4–4 r 7–3–3, have given the best results with cotton. In the cultivation of the steeper lopes care is necessary to prevent damage to the fields by erosion.

A slightly heavier farm equipment is necessary on the Orangeburg fine sandy loam han on the Norfolk soils.

That is somewhat typical, I take it.

Mr. MARBUT. That does not include the series description of Orangeburg, but it is a typical description.

Mr. HAUGEN. The information that you get is known by the community?

Mr. MARBUT. No, sir. The community has no standard of com- parison, and the results of experiments on what is popularly called a loam in one community would not be applicable on a loam in another community for the reason that the loams are not the same because of this lack of a standard.

Mr. HEFLIN. This information enables people in one State to know what the land is in another State, and it is used to make comparisons.

Mr. HAUGEN. It is good for advertising purposes.

Mr. MCLAUGHLIN. I should like to have my question read.

(The stenographer read the question, as follows:)

Is this true, that as the result of your survey you may find a great area of soil to which you give the same name which in reality differs radically in crop-bearing power in different parts of that area?

Mr. MARBUT. No, sir.

Mr. HELGESEN. How do you determine where you are going to make your surveys?

Mr. MARBUT. That is determined in the cooperating States, mainly by the State authorities.

Mr. HELGESEN. I am continually getting letters asking why we can't get soil surveys.

Mr. MARBUT. Several counties have been surveyed in your State.

Mr. HELGESEN. I was wondering whether you have a systematic way of getting at it. What is your system to determine where you are going to make a soil survey?

Mr. SEGER. The department, I understand, asks the Congressman which county he wants surveyed.

Mr. MARBUT. That is not always the case. It is the tradition, however, in this country that if a man wants anything from the Government he asks it through his Congressman, and some of the soil surveys are located in that way. The request comes from the people through the Congressman.

Mr. HAWLEY. You surveyed the State of Alabama? Was that because you failed to find peals all elsewhere and were trying to find some?

Mr. MARBUT. The State of Alabama has cooperated in this work from the beginning and more liberally than any other State.

Mr. HEFLIN. It was the first State to join in a cooperative soil survey. To what extent do they cooperate?

Mr. MARBUT. They appropriate $10,000 a year for soil-survey work.

The CHAIRMAN. How much does the department spend in Alabama?

Mr. MARBUT. I do not know whether I have that data separated for each State, Mr. Chairman.

The CHAIRMAN. I wish you would include the cooperative allotments from the department and the sums provided by the States and put it in the record.

Mr. MARBUT. I will do that.

Mr. WHITNEY. We spend approximately the same amount that the States contributes.

Mr. HEFLIN. I think it was about half and half.

Mr. MARBUT. The total amount spent by the cooperating States was [illegible], about $65,[illegible]. In the same States the department spent $8[illegible],762 in the same year.

The CHAIRMAN. That is practically an offset.

Mr. MARBUT. Yes.

The statement requested follows:

Surveys [illegible] completed by the Department of Agriculture and by individual States cooperating with it during the fiscal year 1915.

	By Department	By States		By Department	By States
[illegible]	$[illegible]	$[illegible]	New York	$[illegible]	$1,372.80
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6,000.00
[illegible]	[illegible]		[illegible]	[illegible]	1,280.00
[illegible]	[illegible]	6,000.00	[illegible]	[illegible]	1,281.35
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9,[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	Total	$[illegible]	$[illegible]

[illegible] Figures not available.

HELGESEN. What shows the difference in character of the rvey on the map hanging on the wall?
MARBUT. The areas shown by cross-lining have been surveyed onnoissance methods. In such surveys we determine the characteristics of the soil. The areas shown in solid red color een surveyed in detail.
HELGESEN. You call that the reconnoissance survey?
MARBUT. Yes.
CHAIRMAN. You want the increase of $30,000 to meet the ds made upon the bureau for increase in work. Is that ?
MARBUT. Yes, sir. We didn't do any work in Minnesota this mmer because of a lack of funds. The same was true of , except that we were able to finish up some old work. We nable to do any work in Maryland for the same reason, and as true of a number of other States.
CHAIRMAN. You have a list of those States? I wish you put them in the record.
MARBUT. I have a memorandum here, which I will read:

following States, from each of which we have recent requests for soil-survey e were unable to do any work whatever: Arizona, Colorado, Connecticut, Maryland, Massachusetts, Minnesota, Montana, Nevada, New Hampshire, xico, Oregon, South Dakota, Utah, and Wyoming.
following States, from each of which we have recent requests for several sur- e were unable to undertake more than one area, and in some cases less than was completed: Delaware, Idaho, Kansas, Kentucky, Maine, Michigan, sey, New York, North Dakota, Oklahoma, Vermont, Tennessee, Virginia, hington.

CHAIRMAN. Is that all?
MARBUT. Yes, sir.
CHAIRMAN. Dr. Whitney, will you take up item 32, on page For the examination and classification of agricultural lands in reserves, in cooperation with the Forest Service"? It will take noment. That is the work you are doing in the Forest Service egating agricultural lands from other lands. You ask for no e?
WHITNEY. No, sir.
HAWLEY. How many acres were examined?
WHITNEY. I don't know. I haven't the figures. A great deal is not reported to us, but it goes to the Forest Service.
CHAIRMAN. In the next item, for administrative expenses, ve an increase of $800.
WHITNEY. That is to provide necessary expenses in connection ie administrative work of the bureau. We find the present riation entirely inadequate.
CHAIRMAN. We are very much obliged to you, Doctor. We ke a recess until 3 o'clock.
reupon, at 12.40 o'clock p. m., the committee took a recess p. m.)

COMMITTEE ON AGRICULTURE
Testimony of Frank

The committee met at 10 o'clock a. m., Hon. Asbury (chairman) presiding.

The CHAIRMAN. The committee has met this morning at of Mr. Hellin to hear Mr. Frank S. Washburn discuss the situation in this country. Mr. Washburn, the committee to you one hour, and I hope you can complete your statem length of time, because this committee is very anxious to the hearings on the appropriation bill. Please give the st your name and address.

STATEMENT OF MR. FRANK S. WASHBURN, NEW Y

Mr. WASHBURN. My name is Frank S. Washburn, of City.

The CHAIRMAN. Now, Mr. Washburn, tell us what you

Mr. WASHBURN. The business in which I am engaged amount to any interest that this committee has is in the m of a nitrogenous fertilizer. If I should say in the fixatio phase nitrogen, I do not know that it would be clearly but that term expresses it properly.

Mr. Chairman and gentlemen, the subject of the fertiliz of this country is so vital to the country, so intricate and f that anything like a full discussion of it in an hour, even if the requisite knowledge of the subject, would be imp What I have planned to say, however, I hope will come the hour. Certainly what I have to offer without any q the committee desires to ask any, will be given in much l hour.

The CHAIRMAN. I suggest, gentlemen, that we let Mr. complete his statement before we ask him any questions.

The food supply is the chief concern of mankind. The problem of maintaining a cheap and plentiful supply has been greatly accentuated during the past few years, and despite the attention of economists, statesmen, and the public generally, no solution is yet at hand. The civilized world is growing at a rate which doubles its numbers in 65 years. Improvements in sanitary science and in the care and feeding of children, the relative infrequency of decimating diseases, and the improved control of deadly epidemics are contributing causes to this unprecedented growth. Hand in hand with increase in numbers there is an increased per capita consumption of food.

For the 10 years following 1900 the population of the United States grew from 76,000,000 to 92,000,000, an increase of 21 per cent. During the same period crop production increased 10 per cent. In practically the same period our exports of wheat and flour decreased from 31 per cent of their production to only 13 per cent. For the same period the importation of foodstuffs and live animals practically doubled, while imported manufactured foodstuffs more than doubled. Beef cattle produced in this country have fallen off 32 per cent in six years, while the population has grown 21 per cent. (From S. Doc. 257, 63d Cong., 2d sess.)

These figures are strikingly reflected in the increased cost of foodstuffs, which, from 1896 to 1912, amounted to 80 per cent in the United States while the general advancement in the cost of living in this period was approximately 60 per cent in the United States and 40 per cent in Europe. The hardships experienced by the wage-earning classes, particularly in the United States, have been very great in view of the fact that the cost of food increases more rapidly than wages—at a rate approximately double. All that has been said relative to food applies with some modification to the clothing of mankind.

These facts point to the necessity of increasing crop yields without additional labor, and that defines fertilizer. European yields per acre are, roughly, double American yields. The use of fertilizer in Europe, per acre cultivated, is enormously greater than in America. The average increase in yield in Germany for the past 20 years has been approximately 60 per cent, in the United States 20 per cent. Abroad the increase is attributed to intensive farming, better selection of seed, the rotation of crops, and, to the extent of 50 to 70 per cent of the increase, to the use of commercial fertilizers.

Emancipation from that toil which is rewarded only by food and clothing, and the hope of social progress lies in reducing the cost of material necessities and thereby enabling society to secure in a constantly increasing degree the benefits of clean and orderly living, recreation, education, and the things which are beautiful. The importance of anything that is or promises to be a material factor in the cheaper production of food and clothing is clearly fundamental. (From S. Doc. 257, 63d Cong., 2d sess.)

Fortunately the remedies appropriate to our fertilizer difficulties are not as numerous by any means as the causes. I believe, therefore, that the best way in which I can contribute something of possible value to your deliberations is to confine myself in the main to what is possibly the most important single difficulty the farmers of this country face in the matter of fertilizing their crops, and the most effective single remedy therefor. I refer to the always high and frequently prohibitive cost of the nitrogen fertilizer as the difficulty, and to Government cooperation in the establishment of the nitrogen industry within the borders of the United States as the remedy.

Customs under which one has been reared from childhood, however artificial they may be in reality, are likely to be viewed all through life as natural and not to be questioned. Fundamental economic conditions in any country, however harsh they may be, are viewed as permanent although not impossible of improvement. They are accepted as the climate is accepted, inseparable from the locality.

[illegible] bushels respectively for oats, [illegible] for rye, 12 bushels and 4 [illegible] and 2 bushels, respectively; [illegible] respectively; average of all [illegible] respectively.

[illegible] fallen so far behind the rest of the [illegible] of all human activities, the cul- [illegible] deficiency in intelligence, ambition, [illegible] ly not in the soil, for soils differ in neigh- [illegible] greatly as between continents. Does it [illegible] factor in the one country and extensive [illegible] No, for the indisputable conclusions from [illegible] based upon extensive farming prove that by application of [illegible] quantities of high-grade fertilizers in extensive farming we get relatively as greatly improved crop returns as in intensive farming.

The practical mind to which these factors are presented naturally springs to the conclusion that, broadly speaking, the German farmer must have found that it pays to use fertilizer and the American farmer must have come to the conclusion that it does not pay, and if the crop yields from the use of a given amount of fertilizer in the one country as compared with the other and the prices realized for the crops are substantially the same, the trouble might be sought for in a higher cost, at least in the relative costs of the fertilizer. There are, as you know, three principal so-called plant foods which constitute the complete fertilizer: Nitrogen, to which we apply the term ammonia in the commercial sense, phosphoric acid, and potash. These [illegible] are valuable rare and expensive in the order named: the

economic importance of the potash element being relatively small, as it constitutes only 20 per cent of the American fertilizer bill. The German farmer pays one-half what the American farmer pays for nitrogen, two-thirds as much for phosphoric acid, and one-fourth as much for potash. The actual figures, as nearly as can be determined, are as to the unit of ammonia $2.45, as compared with $4.63; as to the unit of phosphoric acid (P_2O_5) $0.60, as compared with $0.91; and as to the unit of potash $0.31, as compared with $1.34.

The high cost to the American farmer has fully as serious a significance as these comparisons with German prices would indicate. In support of this statement let us consider nitrogen. It is probably true that a limited amount of nitrogen applied to the soil is profitable substantially regardless of its cost. The effect of additional nitrogen upon increased crop production is known and measurable as a result of continuous experimentation covering a period in England, for instance, of 60 years. These experiments have been directed and supervised by the greatest scientists in every civilized country, and in consequence we know that normally a pound of nitrogen will increase the wheat crop by one third of a bushel of grain and 40 pounds of straw, the corn crop by five-eighths of a bushel, the potato crop by 3½ bushels, the tobacco crop by 10 pounds, the cotton crop by 5 pounds, and so on indefinitely. The American farmer pays, on the average, 28 to 30 cents per pound of nitrogen constituent and, therefore, when we take wheat at 86 cents per bushel and no sale for the straw he practically breaks even on his investment in nitrogen. His entire profit, therefore, must lie in the sale of the extra quantity of straw. On corn at 57 cents per bushel he has a net profit of 25 per cent of the cost of the fertilizer; on potatoes at 60 cents per bushel a net profit of 200 per cent; on tobacco at 10½ cents per pound a net profit of 275 per cent; and on cotton at 12 cents per pound a net profit of 115 per cent. These prices assumed are the five-year average received by the farmer, 1909 to 1913, inclusive. To obtain the true net profit one must deduct the cost of handling the fertilizer from the railway station and applying it to the soil. I want to draw special attention to the significance of the figures which have just been given, in so far as they apply to the cereal crops. Here the profit in the use of fertilizers at prevailing high prices is comparatively small and uncertain. These crops cover 60 per cent of the cultivated acreage in the United States, and in these figures we have in part the explanation of why it is that the use of nitrogen is practically confined in the United States to crops other than the cereals, such as cotton, potatoes, truck, tobacco, etc.

Let us turn to a comparative set of figures based upon the cost of nitrogen to the German farmer. On wheat alone we have a net profit on the fertilizer purchased of 95 per cent of its cost as compared with nothing under American prices and upon the wheat and straw combined, assuming the straw brings the farmer $4 per ton, 145 per cent as compared with 30 per cent, upon corn 140 per cent as compared with 25 per cent, upon potatoes 470 per cent as compared with 200 per cent, upon tobacco 600 per cent as compared with 275 per cent, and upon cotton 300 per cent as compared with 115 per cent. In these figures we see a sufficient inducement to an enormously increased use of nitrogenous fertilizer from the relatively small quantity used in this country to-day to quantities seven to eight times as

[illegible]

The most important single remedy for these conditions is suggested by a mere statement of them. It is the establishing of a nitrogen industry which shall enable the farmer to secure cheap nitrogen in practically unlimited quantities. The world is agreed that this can be done only through the fixation of atmospheric nitrogen. It is therefore accepted the world over that the nitrogen industry and the art of fixing atmospheric nitrogen are synonymous, and as such we shall use them in these remarks.

It is not easy by argument alone to convincingly develop the merits of an economic question. Practical examples of the experience and

practice of others contribute proof which is more convincing. Therefore we would like first to present a picture of the nitrogen industry as it exists in the world outside of the United States, for it has never found footing in this country.

There are two natural sources of nitrogen: One is the plains of Chile and the other is the atmosphere.

Mr. HELGESEN. Where does Germany get its nitrogen so cheaply unless they take it from the earth?

Mr. WASHBURN. They have been securing it in various ways. At the present moment their entire supply, which is greater than it has ever been in the history of the nation, is derived entirely from the fixation of atmospheric nitrogen.

The nitrogen industry is now established in Italy, Austria, Germany, France, Switzerland, Norway, Sweden, Canada, and Japan. It depends upon the use of cheap water power and of this form of energy there is in use 1,000,000 continuous horsepower devoted solely to this one industry. On this side of the Atlantic we have the great water power center of the world, Niagara Falls, and yet if we should take all the power being developed there to-day it would take two and possibly three Niagara Falls to supply this single industry based largely on secret processes and so unfamiliar to Americans that the very name suggests something weird and chimerical. Nearly one-half this amount has been added since the outbreak of the European war, the chief incentive thereto being the necessity for maintaining a powder supply for those nations cut off from the use of Chilean nitrates. Whatever the incentive, the economic advantages of this great development of the nitrogen industry in Europe are as highly valued as the military advantages.

Germany, whose effectiveness in all industrial and agricultural affairs and whose foresight in every material aspect of life the world is called upon to marvel at more and more, has expended in the development of the nitrogen industry since the outbreak of the war $100,000,000, and she has by this means not only secured in a large measure what has been indicated as necessary for the United States, namely, a cheap nitrogen fertilizer in practically unlimited quantities, but she has provided it exclusively from her internal resources both as to labor and materials, thereby making herself independent of imports of Chilean nitrate for which she has expended in the past as much as $44,000,000 in a single year.

The letter of the Secretary of Agriculture to the President of the Senate, hereinbefore referred to, states that in the United States for the year 1913 certain nitrogenous materials in given quantities were used in fertilizers at a cost to the farmer of $48,800,000. The wholesale cost of these materials, as we figure from the data given in the letter, was $55,000,000, while the cost to the farmer delivered at his railroad station was $74,000,000. The report concludes that "the United States is in a position of fortunate independence in regard to ammonia and the present disturbed conditions affect its supply but slightly." Within the limit of application that the report is evidently intended to have, this conclusion is no doubt a sound one, but it must not be interpreted as having any bearing upon the question of the great necessity and advantage to this Nation of establishing within its borders the nitrogen industry. Any man or

any nation can very easily take credit for being independent as to the supply of anything the cost of which is prohibitive for its most important purpose and excessive for all other uses, for the very good reason that under such conditions the demand as to quantity is extremely limited.

If America should use an average amount of nitrogen per cultivated acre equivalent to its use by Germany this country would consume as fertilizer 960,000 tons per annum. According to the letter of the Secretary of Agriculture already referred to, this country in 1912 used 132,500 tons of nitrogen, or less than one-seventh as much per acre cultivated as Germany. It is quite clear that the sources of nitrogen practicable to the United States would not afford more than the barest fraction of this larger quantity.

The establishment of the nitrogen industry in the United States will mean more than a contribution at reduced cost to the increased available supply of nitrogen. It is astonishing that frequently in the development of the world's intricate inventions the factor which was looked upon as comparatively simple constituted the great secret of success. We have a case somewhat analogous in the nitrogen industry. There are certain details in its relation to phosphoric acid that I can not go into, which are going to make the nitrogen industry as important to the phosphoric acid constituent of fertilizers as to the nitrogen constituent. Take, for instance, the Bell telephone. What made the Bell telephone? Dr. Bell did not invent the idea. The idea was patented before he conceived it, but he turned a certain screw just 90 degrees and made the Bell telephone a practical commercial device. This gave rise to one of the most important and bitterly fought patent contests in the country, but it ended in supporting the claimed value for this simple factor. The same thing is true of the sewing machine. The eye of the needle was transferred from the base to the point and that constituted the basic factor of the sewing machine.

The nitrogen industry goes much further than a contribution to the supply of nitrogen because its proper and feasible development will carry as a consequence the production of cheap high-grade phosphates, the advantage of which may be as great as that attributable to nitrogen alone. When we consider that 80 per cent of the total fertilizer consumption in this country is in nitrogen and phosphoric acid as compared with the total composed of nitrogen, phosphoric acid, and potash it becomes clear that with these two constituents radically affected there has been wrought a great economic change. In the letter of the Secretary of Agriculture heretofore referred to these statements are to be found:

For the immediate relief of the phosphate situation which is dependent upon the price of sulphuric acid, the production of an increased supply of acid is essential. Under normal conditions the supply of sulphuric acid in this country is fully adequate to meet the demand, and the private investor is loath to put money into a plant for the production of acid under conditions which are abnormal and which may cease at any time. There is, however, the possibility of the use of hydroelectric energy in the electric furnace for the treatment of phosphate rock to produce phosphoric acid. The Bureau of Soils has conducted some experiments on a laboratory scale and has secured data sufficient to warrant larger experiments on a commercial scale. It is now installing at its Arlington plant equipment to try out on a semicommercial scale methods for producing phosphoric acid and nitrogen products by electric-furnace methods. This process is only commercially feasible when cheap power can be secured. The ordinary

price at which hydroelectric power in this country is sold makes the use of this power for fertilizer production by present methods out of the question. There is a possibility of securing water power in the Southern States in proximity to the Southern phosphate beds.

The report might have added that there is already in operation near Charlotte, N. C., a plant involving an investment of $150,000 employing an electric furnace of 5,000 horsepower capacity engaged in the production of phosphoric acid. The operation at the moment is not commercial because of its unfavorable situation as to raw materials, the high cost of power, and the absence of certain refinements in operation which it is hoped may be introduced later.

The report states that experiments have been conducted by the Agricultural Department for some time with the purpose in view of developing an electric furnace-process for the production of nitrogenous products and phosphoric acid in such a way as not to infringe existing patents, the anticipation being that the process can be applied to western phosphates. I quote again as follows:

With the production of phosphoric acid and ammonia in one operation, the highly concentrated product, ammonium phosphate, can be manufactured, combining the phosphoric acid with a product approximately four times as valuable, which could be put on the market in the East at a reasonable figure despite the long freight haul.

And the report might have added that the ammonium phosphate fertilizer is already a commercial accomplishment; in proof of which I may say that an enterprise for its production is engaged now in the installation of a plant which, together with the provision which the owners have made for securing the necessary raw materials first hand, involves an initial investment of $5,000,000. That will be placed in New York Harbor. It is now under construction.

Reference has been had in this discussion to the various factors which have played a part in the increased crop yields of Europe and the intensive method of farming is credited with being, next to the use of artificial fertilizers, the most important. Intensive methods mean the employment of an inordinate amount of labor in the fields. The United States is excluded from such means because of the disproportionately high agricultural wages which it pays in comparison with Europe, the American wage for the day's work being for men $2, as compared with $0.50 in Europe. Therefore we have a vital interest in fortifying ourselves even more strongly on the fertilizer side than Germany, else we establish a steady pressure to decrease the income of the man who works in the fields.

We would be closing our eyes to a very definite new thing bearing upon the importance of the nitrogen industry should we fail to consider the fact that in the event of war with any nation possessing a navy, though inferior to that of the United States, able to cut us off from the nitrates of Chile in South America, we should be without powder and utterly helpless, however great an Army and Navy we might have and however well they might be equipped with modern guns of every description. The absolutely necessary military explosives are prepared from nitrogen procured from the so-called saltpeter of Chile, and no other adequate source is known to mankind except the atmosphere.

Fertilizer, after all, is essentially a labor-saving device. It is what America has found necessary in every industry and activity, namely, to give high-priced labor a labor-saving device. The nitrogen plants

V.

[illegible]

[illegible] conclusion based upon the [illegible] nitrogen industry will find it impossible to realize [illegible] this country is borne out by the [illegible] conducted by the two principal nitrogen fixation processes covering a period of four years in the case of one and three years in the case of the other. Their engineers have investigated the power possibilities in various parts of the United States, with the result that extremely few sites have been found at all practicable, and none of them transformable to the requirements of the nitrogen industry with that degree of advantage which makes them attractive.

Therefore, we feel warranted in the belief that if the nitrogen industry is to be established in the United States it must be able to secure power by means not yet provided for under our laws and at much lower cost than it can be secured by ordinary commercial methods. There is one agency through which this possibly may be done, namely, by the Federal Government supplying power at a navigation dam built by the Government. It is possible that this may be done on terms which involve no sacrifice to the Government.

Every art, every profession, every industry has some great peak point characteristic about which that particular human activity revolves. The art of developing water power subordinates itself absolutely to the vital relationship which exists between the cost of the power per horsepower-year and the interest rate at which money is secured for investment. Let us take, for example, a hydroelectric power site in Canada requiring an investment of $40 to provide all things necessary to the conversion of the power of the water into a continuous electric horsepower and another site in the United States requiring an investment of $100 per annual horsepower; the plant in Canada to be built by private capital burdened by the usual interest and amortization charge of 10 per cent, and the one in the United States to be built by the Government subject to an interest and sinking fund charge of 4 per cent. The cost per annual horsepower furnished by the Canadian plant would therefore be 10 per cent of $40 plus $2 for out-of-pocket administration and upkeep expense, equal to a total of $6, while the corresponding costs in the United States would be 4 per cent of $100 plus $2, likewise equal to $6. We therefore see that while the investment in the one case is two and one-half times the investment in the other the cost of the electrical current development is the same. It therefore may be possible by Federal legislation to set down in the heart of the United States the cheap waterpowers of Canada, of Norway, or of Italy and Dalmatia without cost to any one, and with all their advantages. Is there any questions as to such legislation representing the highest type of statesmanship?

Mr. HEFLIN. Have you finished your statement?

Mr. WASHBURN. Yes, sir.

Mr. HEFLIN. Mr. Chairman, I have a few questions that I want to ask Mr. Washburn. Mr. Washburn, in value what was the total fertilizer bill of this country as shown by the last annual records?

Mr. WASHBURN. The 1914 records, which have been worked up in part, are within 2 or 3 per cent, probably, of being correct, and show in round figures $75,000,000 for the nitrogen, $65,000,000 for the phosphoric acid, and $35,000,000 for the potash.

Mr. HEFLIN. What percentage of the total annual bill is represented by phosphoric acid, nitrogen, and potash?

Mr. WASHBURN. The total bill was $175,000,000. The proportions are a trifle over 40 per cent for nitrogen, somewhat over 35 per cent for phosphoric acid, and about 20 per cent for potash.

Mr. HEFLIN. What effect has the European war had upon the nitrate situation, and how does the price of Chilean nitrate before the war compare with the price since the war began?

Mr. WASHBURN. This report shows the average price for Chilean nitrates to be about $47 a ton. I think it is now selling for $72 a ton.

Mr. HEFLIN. Is there any hope that the price of nitrates will be materially reduced before the end of the European war?

Mr. WASHBURN. That is not the anticipation of the trade.

Mr. HEFLIN. Do you expect that upon the end of the European war the price of potash will fall to the normal rates prevailing before the beginning of the European war?

Mr. WASHBURN. I think so, yes. There is reason for that. The potash rates are fixed by the German Government, and they can drop very materially and still leave a handsome profit to the producer.

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

ut your suggestions for the construction of dams for taking nitrogen rom the air?

Mr. WASHBURN. My anticipation is that the establishment of the itrogen industry, as it can be established with what I believe and hat I believe would appeal to those who study the subject is the roper and legitimate Government cooperation, will give the farmer is fertilizer for one-half of what he would otherwise pay for it.

Mr. HEFLIN. Does your company own any water-power sites in ıe United States?

Mr. WASHBURN. No, sir.

Mr. HEFLIN. Do you believe that you could readily secure sites r ample power for the purpose you have described?

Mr. WASHBURN. We have never been able to find any site that e thought was capable of commercial development for our pur-ɔses.

Mr. HEFLIN. If the nitrogen industry should be established in ıis country, then we would have the three necessary fertilizer gredients, would we not?

Mr. WASHBURN. Yes, sir.

Mr. HEFLIN. Do you hope to see this country become independ-ıt of Germany in respect to the potash supply through the devel-ɔment of the electric furnace?

Mr. WASHBURN. We have worked a great deal on the potash roblem, and we do not see any chance at the moment of displacing erman potash. I think this, however, that the ingenuity of men ıay develop from some source a potash process which will prevent xtortion by Germany, but any commercial enterprise which should :art making potash in this country by any of the processes that we now anything about to-day would have to close its doors through ɔmpetition with German potash.

Mr. HEFLIN. Then your position is that this country must secure ıs nitrate supply from the air?

Mr. WASHBURN. Yes, sir.

Mr. HEFLIN. That is all.

The CHAIRMAN. Mr. Washburn, have you investigated the possi-ɨility of supplying this country with potash from the kelp beds of the 'acific Ocean?

Mr. WASHBURN. No; I have not.

The CHAIRMAN. So that you would modify your statement, then, vhen you say positively that there is no possibility of meeting German :ompetition in the manufacture of potash in this country?

Mr. WASHBURN. I want to say that I did not have the kelp beds ın mind at all.

The CHAIRMAN. Well, you mean by other processes?

Mr. WASHBURN. I mean by what we call synthetic processes.

The CHAIRMAN. Yes; I understand.

Mr. WASHBURN. I know nothing of the possibilities of kelp beds.

Mr. WILSON. Mr. Washburn, you stated that this country, if they developed this potash industry, could not compete with Germany. Explain why they could not.

Mr. WASHBURN. Because nature has disposed potash so cheaply of development by mining processes that you can not build up the same material synthetically with the expenditure of so little power and ıergy and raw materials as to compete. One is a natural material

[illegible] power. The exigencies of the [illegible] that she could not wait to develop her water [illegible] a question of a steam boiler and a [illegible] electrical generating machinery which she, in her [illegible] could supply quickly.

Dr. [illegible] Will you let Mr. Washburn if, in his experience [illegible] the feldspars, he has not referred to the silicates [illegible] the feldspars for the conversion of potash from feldspar?

Mr. Washburn. Yes; I have that in mind as the principal [illegible] that have been prospected.

Dr. Weed. And which you have found uneconomic?

Mr. Washburn. Yes; I might say, as a practical matter, [illegible] organized in the last month, I think, [illegible] They base their estimated profits on their [illegible] either $100 or $150 a ton. It sells [illegible] at $40 a ton. I believe that

rocess, certainly of all processes which have been brought to us
id which have been investigated by us, looks the most feasible.
The CHAIRMAN. Mr. Washburn, you spoke a while ago of certain
ecret processes of getting nitrogen from the air. Who controls
ese processes?
Mr. WASHBURN. What I intended to convey was that the methods
which these processes are practical are secret. You ask who
ntrols them?
The CHAIRMAN. Yes.
Mr. WASHBURN. They are controlled primarily by an Italian
mpany in part, and the Italian company has its subsidiaries
attered all over the world. The American Cyanamid Co. is the one
this side of the Atlantic, with a plant at Niagara Falls, in Canada.
The CHAIRMAN. What is it costing that plant to turn out nitrogen
rtilizer per ton?
Mr. WASHBURN. You mean per ton of nitrogen?
The CHAIRMAN. Well, we farmers here are speaking in terms of
e nitrogen that goes into commercial fertilizer.
Mr. WASHBURN. Per unit of ammonia?
The CHAIRMAN. Yes.
Mr. WASHBURN. The direct cost, leaving out selling and overhead
arges and items of that kind, which all vary with the quantity, is
out $1.25 per unit of ammonia.
The CHAIRMAN. Translated into tons, that would be how much?
Mr. WASHBURN. Suppose we put it into sulphate of ammonia per
n. That is something you all know about.
The CHAIRMAN. Yes.
Mr. WASHBURN. It would be $31.25.
The CHAIRMAN. How does that compare with the price in Ger-
any, plus the overhead charges?
Mr. WASHBURN. You mean the price or the cost?
The CHAIRMAN. I mean the cost, and then add to it the transporta-
on charges from Germany here. What I am trying to find out is
hether or not Canada, for instance, has developed a process by which
e can manufacture nitrogen in competition with Germany, plus the
verhead charges and freight rates from Germany to Canada or to this
ountry. That is the point I am getting at.
Mr. WASHBURN. It is feasible to manufacture in Canada, with the
heap power there, and transport the material to the United States.
The CHAIRMAN. Now, will you tell us in that connection how it is
hat water power is cheaper in Canada than in this country?
Mr. WASHBURN. It is due to natural conditions, and those natural
conditions are reflected in the geology of the country and in the char-
acter of the rainfall. Let us take Norway, because that is a better
illustration commercially. Norway is in a far northern latitude, as
you know. The precipitation on the watersheds is more regular
hroughout the year than with us. We have practically a rainy sea-
on and a dry season, and our waters rush off down the stream and
eave us without any water or any flow in the dry season. In Nor-
vay the streams run with almost perfect regularity. It is a high
lateau, and that plateau comes to the edge of the sea and drops in
nany instances right off these cliffs into the salt water. At one of
hese Norwegian water powers, at Thelemarken, I believe it is, the

... square mile of watershed ... it ... drop over. You state of ... of the ... railway ... that is pos- ... about 60 feet of water there. It ... to put it in ... power. If this country ... have to find ...

... there ... the situation when ... is due to nature ... drops something over 30 feet, ... which is an enormous natural ... mouth of that lake gives a storage ... that anything like those that ... There a million horsepower ... figures show a loss of less than $4— ... horsepower can be developed for about ...

... of power in this country ... which you described to the water ... that are available to the public? ... there are will be available to the ... the future, and would involve a ... Washington there are some very fine ... power, but I rest happy ... the possibility of being capable of ... amount of power that is, with ... a good ... because it involves the ...

... but it will involve ...

... Are there any other powers that you think ...

... a power on the Tennessee River at ... possible and things considered, of most extra- ... It is an expensive one to develop, ... very great, greater than any single ... for a number of years after its initial ...

Mr. HUDDLESTON. That is a splendid power site and there is plenty of water in that river.

Mr. WASHBURN. ... the Tennessee River drops in its flow very materially ... short period, and eventually some reinforcement of that short period would have to be made, which is feasible. The ... about 200,000 horsepower for 90 per cent of the time.

Mr. LEA. What about the development of horsepower on the Coosa River between Rome, Ga., and Montgomery, Ala.?

Mr. WASHBURN. There is a drop in the river there, about 320 feet altogether, ... mile, and various shoals requiring dams at various ... powers are very expensive of development.

The CHAIRMAN. Now, could you hope to develop water power on
ie Columbia River, for instance, cheaply enough to permit you to
anufacture nitrogen and ship it by way of the Panama Canal to the
tlantic seaboard and sell it in competition with the Chilean nitrate?
Mr. WASHBURN. I think that can be done; yes. It would involve
very large initial investment, requiring to be placed upon the market
amount of product which the market at the moment is not ready
r. While it is physically possible, commercially it would be a risky
id possibly an impracticable undertaking.
The CHAIRMAN. Well, I suspected that. That brings it a little
oser home. The bulk of the fertilizer of this country is used on the
tlantic seaboard?
Mr. WASHBURN. About 60 per cent of the fertilizer of this country
used in the seven Southern States.
The CHAIRMAN. That is true; but some of it is used in the truck-
owing sections of the New England States.
Mr. WASHBURN. Yes, sir; New England is the next user in quan-
y.
The CHAIRMAN. Now, to find any plant, therefore, that is feasible
id that will furnish nitrates to the Atlantic seaboard and the New
ngland States as cheaply as you can get them now from Chile, it
eans that you have got to find your water power in proximity to that
rritory. Is that right? Certainly close enough proximity to keep
e transportation charges from destroying your competition.
Mr. WASHBURN. That is correct.
The CHAIRMAN. Now, at this Muscle Shoals Point, or dam, or what-
er they have got down there, is there sufficient power to develop a
ant large enough to supply this country with its nitrates?
Mr. WASHBURN. To supply half of them.
The CHAIRMAN. Now, what about this Coosa River, in Georgia, that
r. Lee speaks of?
Mr. LEE. And Alabama.
The CHAIRMAN. Well, Alabama can not claim all the good things.
Mr. WASHBURN. I do not know what the total of the power is on
iat stream.
Mr. LEE. About 340,000 horsepower, so Maj. Ferguson says.
Mr. WASHBURN. Well, if they had 300,000 horsepower, that would
rnish the other half,
The CHAIRMAN. So that you make the statement that, in your judg-
ent, there is sufficient power close enough to these fertilizer-using
ates to supply all the nitrates that these States may need to use?
Mr. LEE. And the United States?
The CHAIRMAN. Yes; and the United States?
Mr. WASHBURN. Yes; on its present consumption.
Mr. HEFLIN. Now, what in your judgment is necessary to be done
establish these plants? Is there anything that the Government
n do that it has not done by way of encouragement or aid that would
lp in this matter?
Mr. WASHBURN. Now, let us go to the other end for a moment.
oughly speaking, for our purposes here, we may say that the
wer is about half of the investment, and the cost of money raised
on a commercial enterprise is so great that you can not afford
ch a great power investment. The interest rate kills you. The
cret of coming into the United States, therefore, in order to meet the

Mr. LEE. You speak of the Government making the investment to build the dam. What objection would there be to private capital building the dam and relieving the Government of that expense and giving the Government the privilege of navigation? Don't you think that would be a feasible and quicker proposition? In other words, I know to-day that if you were to pass a dam bill on the Coosa River that in 50 days you would get a company to build a nitrate plant if you passed a bill similar to the one that President Taft vetoed.

The CHAIRMAN. Is that true, Mr. Washburn?

Mr. WASHBURN. I do not know of any sufficient inducement or any inducement at all that could possibly warrant at this time the establishment or the building of a dam on the Coosa River and the establishment of a nitrogen industry there.

Mr. LEE. I know the proposition has been made, and I had some knowledge of the gentlemen who desired to do that.

The CHAIRMAN. If the inducement does not exist now, Mr. Washburn, with nitrate selling for double what it normally sells for, you would hardly expect any inducement when this war is over?

Mr. WASHBURN. No.

The CHAIRMAN. Now, let us see if we get your exact proposal. Your proposal is that the Government shall advance or loan to these nitrate companies money at a very low rate of interest to help in the development of these water powers. Is that the proposition?

Mr. WASHBURN. No.

The CHAIRMAN. Suppose you give it to us just as concretely as you can, so that we can get your definite proposition before us?

Mr. WASHBURN. Mr. Chairman, do not misunderstand me——

Mr. HEFLIN (interposing). Tell us just what the Government should do.

Mr. HAUGEN. I desire to ask a question. Could the power on the Mississippi River be utilized?

Mr. WASHBURN. No; it is not cheap enough.

Mr. HAUGEN. We have the power already at Keokuk?

Mr. WASHBURN. Yes; but it is too valuable for other purposes.

Mr. HAUGEN. How about the power of the spill dam at Panama?

Mr. WASHBURN. At Panama?

Mr. HAUGEN. Yes; the spillway. I understand that there is considerable power going to waste there. The power is there.

Mr. WASHBURN. It would not be sufficient for any large undertaking.

Mr. HAUGEN. Can you give an estimate?

Mr. WASHBURN. No, I can not; but I am pretty familiar with the condition there.

Mr. HAUGEN. My understanding is that several thousand horsepower goes to waste annually over there.

Mr. WASHBURN. Of that I have no accurate knowledge. My impression is that there would not be sufficient steady power for our undertaking.

Mr. HAUGEN. Have you investigated that?

Mr. WASHBURN. No, I have not.

Mr. HAUGEN. I think you will find that considerable power is going to waste there.

Mr. WASHBURN. Yes.

Mr. HOWARD. Mr. Woodhouse, that is pretty well [illegible] and he [illegible] undertaking to [illegible] with [illegible] and a power site, and that is to secure [illegible] rights there and [illegible] about the right for the use of water [illegible] flood that policy is going to be productive of [illegible] of water power in the country?

Mr. WOODHOUSE. Yes, I do. I think that the [illegible] of water power will not proceed without a general [illegible] we call it under which people who apply must secure permission to [illegible] done. Where there is a rate of rental fixed it is quite [illegible] the Government the effect will be problematical. I would [illegible] the water if it should be done.

Mr. HOWARD. But if it is necessary to lease water-power sites [illegible] public lands and in the mountainous countries, it would seem to be [illegible] well, just to establish the same principle in granting the same rights on navigable streams.

Mr. WOODHOUSE. That I could not answer, because I have not yet clearly in mind the difference in conditions, and I have not the knowledge how to make the comparison between public lands and navigable streams.

Mr. HOWARD. But on general principles you are in favor of leasing water-power sites for a stated period of years, rather than allowing them to go into permanent ownership of those who develop them?

Mr. WOODHOUSE. Is there any difference in the two? When a permit is given it is equivalent to leasing the area at that point for a dam—we will say. That lease may be given for nothing a year, or it may be given for so many cents a horsepower, or some other figure.

Mr. HOWARD. Well in the acts we have passed we leave that to the discretion of the secretary of the Interior to fix the terms of the leases with the right to modify them at stated intervals during the [illegible] of the lease.

Mr. HOWARD. You suggest a general dam act, instead of a special act? You think that would be all right?

Mr. WOODHOUSE. I think it would be all right.

[illegible] I want you to state to the committee just the [illegible] you have to offer the committee that will bring about [illegible] and I think of all of us, to make this country self-[illegible] as soon as possible.

Mr. WOODHOUSE. Mr. Chairman, if you will permit me, I want to [illegible] for two reasons, because——

[illegible] Well what suggestion have you to [illegible]

Mr. WOODHOUSE. [illegible]

[illegible]

Mr. WOODHOUSE. [illegible] to make a quantitative suggestion [illegible] we believe a solution can be [illegible] Government shall build the [illegible] which is ordinarily a [illegible] a part of [illegible] the substructure of the [illegible] be Government [illegible] the water which

d the electric generating machinery and deliver the current upon
ıat we call the switchboard; that is, at the point of purchase, and
arge to the users, in this case the nitrogen industry, the interest
te on the investment that the Government pays on its lands.
The CHAIRMAN. Three per cent?
Mr. WASHBURN. Three per cent.
The CHAIRMAN. You have said that the user of the power was to
y to the Government 3 per cent on the investment?
Mr. WASHBURN. On the investment.
The CHAIRMAN. Are there any dams in existence now built by the
ıvernment at which you might operate one of these plants?
Mr. WASHBURN. No; for the reason, chiefly, that there are no
ms where there exists a great quantity of continuous power.
The CHAIRMAN. Your thought would be that the Government
ıuld erect its dam at Muscle Shoals, probably, and probably on
e Coosa River, certainly within the territory contiguous to the
tilizer-using section of the country, and I believe you said a mo-
ıt ago that there was such an amount of power to be developed
ere which would furnish sufficient power to do the work?
Mr. WASHBURN. Yes, sir.
The CHAIRMAN. Now, your other proposition, a moment ago, im-
essed me as carrying the idea of the direct loan from the Govern-
ıt to the users of this power for the purpose of putting in their
ıt at the very low rate of interest. Is that one part of your idea?
Mr. WASHBURN. No; that is not. That would be a method.
The CHAIRMAN. Yes.
Mr. WASHBURN. And from the standpoint of private interests, so
as I know and can think of for the moment—I was giving you
e mental process of evolution of the argument by which it is neces-
ry, in order to establish these plants in the United States, that there
all be cheap money——
The CHAIRMAN (interposing). To get the cheap power?
Mr. WASHBURN. To get cheap power.
The CHAIRMAN. Now, then, your real proposition, however, is that
e Government should build dams at these points of power, put in
e groundwork for your plant, and, as you say, turn over to you at
nominal rate the power on your switchboard that would equal 3
r cent?
Mr. WASHBURN. That would equal 3 per cent. Let me say again
at is not my proposition. But, so far as I can see, considering all
the political difficulties and everything else, that is the most feasi-
e proposition that has been advanced.
Mr. WILSON. Right there, would you not charge anything extra for
ıar and tear on the property?
Mr. WASHBURN. I expect that to be kept up by the user of the
wer.
Mr. HEFLIN. That 3 per cent, do you count that on the whole in-
stment in building the dam and substructure?
Mr. WASHBURN. Yes, sir.
Mr. HEFLIN. Now, then, if the Government did build this dam at
ıscle Shoals, on the Tennessee River, it would not only equip you,
any company that did this work with the power, but it would
ake the river navigable there for miles, would it not?

[illegible] some form of navigation provision [illegible] the Government and the people with [illegible] the commerce that we have on that [illegible] Muscle Shoals. It is a link that is practically

[illegible] Mr. Washburn, what would be the initial [illegible] of these plants to which you have [illegible] the superstructure for the nitrogen plant

[illegible] Mr. [illegible] it would run, we think, about $[illegible]

[illegible] $[illegible]?

Mr. WASHBURN. Yes.

Mr. [illegible] What would be the cost, then, to the private party to [illegible] their work?

Mr. WASHBURN. About $[illegible].

The CHAIRMAN. It totals, then, an expenditure of $60,000,000?

Mr. WASHBURN. No; it is a total expenditure of $40,000,000. I [illegible] your question, but the total expenditure [illegible] and under this suggestion would be about $[illegible] the Government and about $20,000,000 to private interests. I believe, however, that the Government expenditure [illegible].

The CHAIRMAN. Upon what do you base those figures?

Mr. WASHBURN. Upon very carefully drawn estimates of plant [illegible] installation at that point.

Mr. MCLAUGHLIN. A few minutes ago, as I remember your statement, you said that private interests are required to pay about three times as much interest as they might be required to pay if they were using Government money, or if Government money was supplied. Now, you speak of the Government supplying money at the rate of 3 per cent interest. Would it cost private interests, or the getting of private moneys, rather, require them to pay 9 per cent interest?

Mr. WASHBURN. Yes. By the time one is through with American methods of financing, underwriting, and brokerage fees, reports, selling of securities for less than par, money costs 9 per cent.

Mr. RUBEY. Mr. Chairman, that is very much at variance with my idea of things. It is my idea that the corporations and those people get their money at a great deal less than 9 per cent. I think you are thinking about the farmer, when you are talking about 9 per cent.

Mr. WASHBURN. The condition, gentlemen, is this: I think that the farmer pays out 9 per cent primarily, where he can see it go out, and the corporations do not.

Mr. RUBEY. The corporations in this country--you can go on the market and buy paper of corporations all over this country to-day at from 3½ to 4 per cent.

Mr. STEELE. Not on a new project.

Mr. ANDERSON. As I figure it, assuming a development of about $600,000 on these two items, one on the Coosa River and one on the other, on a basis of 3 per cent money, the cost of delivered horsepower would be about a dollar, would it not?

Mr. WASHBURN. A dollar a horsepower?

Mr. ANDERSON. Yes.
Mr. WASHBURN. No; about $100.
Mr. ANDERSON. I am not talking about the investment cost, I am king about the annual cost of delivered horsepower.
Mr. WASHBURN. It would run between $3 and $4, and then up- p and out of pocket expense would run another dollar and a half so, and it would make the power cost about $5.
Mr. STEELE. What assurance would the Government have, if they nd $40,000,000 or $20,000,000, that the enterprise would con- ue so that they would receive their 3 per cent annually?
Mr. WASHBURN. I expect that the Government would have a rtgage on the property. Just how it could be worked out I do not ow, but their security for what the company is to pay them should the property of the company.
Mr. HAUGEN. If the Government built the dam it would own the n, and it would not be necessary to put a mortgage on it.
Mr. LESHER. How many kilowatts in a horsepower? I did know, t I have forgotten. Do you know?
Mr. WASHBURN. Seven hundred and forty-seven watts. A kilo- tt is about 1⅓ horsepower.
The CHAIRMAN. Let me ask just two more questions, and then I through. This is a very interesting and important proposition. d Canada, in this initial work in installing this nitrogen fixation thod of getting nitrogen, subsidize this company at Niagara in y sense?
Mr. WASHBURN. No. To be entirely accurate, they admitted to nada free of duty the equipment, a portion of it in the first devel- nent, and that was the only thing that Canada ever did.
The CHAIRMAN. What connection does the Norwegian Government ve with those plants in that country?
Mr. WASHBURN. None.
The CHAIRMAN. They are private enterprises all the way through?
Mr. WASHBURN. They are private enterprises.
Mr. HAUGEN. The plant in Norway is owned largely by French ople, is it not?
Mr. WASHBURN. Yes; French banking interests only. One of the nts in Norway, a plant which has an output of as much as the nch plant, possibly a little more now, is owned by English capital.
The CHAIRMAN. I believe you said a moment ago that this method extracting nitrogen from the air was a secret process?
Mr. WASHBURN. The process in itself is very simple and known to eryone, but the methods of carrying it out are not public; for tance, we have in just one stage, in one of the large buildings ere we carry out what we call the nitrifying, in one of those proc- es there, we have 20 different factors, which have to be con- lled; pressures, and temperatures, and heat evolutions, and one ng and another. Now, one might know all about the theory and wholly incapable of making the thing work in practice.
The CHAIRMAN. That is what I am trying to get at. Are these ocesses available to the general public, or are they controlled by e firm or set of men in this country?
Mr. WASHBURN. They are controlled by one concern under patents.
The CHAIRMAN. Under patents?
Mr. WASHBURN. United States patents and Canadian patents.

The CHAIRMAN. So that any immediate development of the nitrogen industry in this country would be through the Government subsidy to a monopoly controlling the process?

Mr. WASHBURN. I should not call it a subsidy.

The CHAIRMAN. Well, call it aid, then.

Mr. WASHBURN. And I should not call it a monopoly, in the sense in which that word is frequently used, because a monopoly is not an undertaking which will give to the Government for its requirements its products at cost, to the low cost of which the Government itself contributes, and a reasonable manufacturer's profits, as we will see, to be fixed at the will of any Government official who had charge of it.

The CHAIRMAN. I asked you the question. I did not use the terms offensively at all.

Mr. WASHBURN. I appreciate that.

The CHAIRMAN. But I asked the question to bring out the very answer you gave. Now, then, is it a part of your plan, that, in consideration of this work upon the part of the Government in getting you this cheap money through the building of the dam and so on, that you, in return, shall give to the Government the power to regulate the price of your output to the American farmer?

Mr. WASHBURN. I do not know how that feature can be worked out. I will say this, that it would be folly for private interests to have in anticipation that the Government would undertake any part in cooperation with private interests, unless it had a feeling of assurance that the product was going to be sold to the farmer and at so low a rate as to make Government cooperation worth while. Now, what form that will take I do not know.

The CHAIRMAN. I want to get your view of the principle involved. You say that there would be no objection from your point of view to the Government having the power to regulate the price of the output of these plants which it helped to build?

Mr. WASHBURN. Mr. Chairman, on that I have to speak very tentatively, and if you will bear with me for a moment, I would like to develop it.

The CHAIRMAN. I think that you recognize that that is a very important point.

Mr. WASHBURN. That principle must be subscribed to. If you wish me to, I will take two or three minutes to develop that view.

The CHAIRMAN. All right, go ahead.

Mr. WASHBURN. I am not sure at all--it may be both the most feasible and direct method, but at the moment I doubt the feasibility in the interests of the people, or the interests of private capital, of placing in the hands of any board, commission, or any individuals the power to artificially regulate the price of anything, and I feel so because I have so many evidences of the regulating power of commerce and industry in itself.

Let me take, as an example—when I speak of the meat industry or packing industry, I am speaking of something that has not the full sympathy of the farmer. I am going to risk using the example, notwithstanding.

A short time ago I noticed in a New York paper the advertisement of certain bankers, who wished to sell a new issue of bonds of $10,000,000 of one of the large meat-packing companies in Chicago. A part of the advertisement was the statement of the auditors who had

dited the books of this concern. We know that there are no more liable and conscientious people than the best of auditing concerns. they had had any inducement whatsoever that would have varied em from a perfectly fair and truthful statement of the books, they ould have been induced to show the profits of that concern as large they could, because they wanted to sell bonds, and the greater the ofit the higher price the bond would bring in the market. There nothing special about this, just picking it up in the newspaper and ading it. They say that the concern had a business of $450,000,000 e year before; that the profits were not quite $10,000,000, $9,700,000 close enough. Do you realize what that means? That the packing dustry, as represented by this particular company, and I suppose it like the others, with the employment of all of the extraordinary bor-saving devices that are gathered in these great packing con-rns, and able men who specialize all their lives on just one thing, id therefore can do it to a degree of perfection that a man with a mber of things to do can not possibly attain, and with the employ-ent of great facilities in transportation, and using every single product at comes from a steer or a hog that is manufactured into meat—r you know nothing is wasted—they turn over every particle of that the people of this country at what it costs them, and then say, Just give us 2½ cents on a dollar."

Mr. HAUGEN. The statement that they turn it over to the farm-s——

Mr. WASHBURN (interposing). To the people, not the farmers.

Mr. HAUGEN. To the people, in my opinion, is not a fair statement.

Mr. WASHBURN. I want to modify that. They turn it over to hoever may make the purchases of them.

Mr. HAUGEN. No; they turn it over to the subcompanies. The erators of the packing houses form a subcompany, and that sub-mpany buys the product or the article direct from the packer at a duced price, and they sell it at a profit. For instance, the investi-ation conducted by Mr. Garfield showed up a profit of $1.38 a head; ibsequent investigation disclosed the fact that the packer sold hides their subcompany at 4 cents when hides were worth 14 cents. vidently hides were sold at a greatly reduced price, and of course ere sold by the subcompany at a big profit; the same applied to e express companies. The operators of the railroads form a sub-mpany to operate the express company at a large profit. First, e subcompanies get a reduced rate from the railroads, and then arge exorbitant prices from the shipper. Under such conditions do not want a statement to go out that the packers are so generous their operations as to conduct their business at such low profit.

Mr. WASHBURN. It would not be a question of generosity. It ould be a question of how business conducted on such a large scale n be handled with reference to the profit on a unit of production.

Mr. HAUGEN. I take issue with the gentleman as to the profits, but think the point that you are going to make will bear out your tement that the bonds would not be attractive to the investor.

Mr. MCLAUGHLIN. And you spoke of a profit of $10,000,000 as a urn of 2 per cent to 2½ per cent on the business of $450,000,000, t what return was that on the investment?

Mr WASHBURN. That I do not know; but are we interested in the return on the investment? What the people are interested in is how much they pay in addition to the minimum cost of the article.

Mr MCLAUGHLIN. I presume society is interested in that; but you were speaking of the difficulty of getting money for investment, and I have had a notion that an investor looks to the return on his investment. He looks to his profit, and it may be necessary in using his money furnished for investment to look at the total amount of the output. But is not he primarily interested in the measure of profit on his investment?

Mr WASHBURN. Quite right.

Mr HAUGEN. The profit on the investment and the security offered?

Mr WASHBURN. Yes. Now, the profit on that investment may have been large.

Mr MCLAUGHLIN. But you are not able to tell us what the investment was?

Mr WASHBURN. I can not.

Mr OVERMYER. What does the $450,000,000 represent?

Mr. WASHBURN. The year's sales.

The CHAIRMAN. Coming back to the proposition I asked you about a moment ago, the power of the Government to regulate in some measure the price of your output. It has been suggested to me that I ask you this question, whether or not you concede to the Government the power to prevent this company, which in a measure must be a monopoly, from charging exorbitant prices for its output.

Mr WASHBURN. I should say yes to that, unquestionably.

The CHAIRMAN. Now, let me ask you one further question about this process. Who controls this process in this country, your company?

Mr WASHBURN. Yes.

The CHAIRMAN. What is the capital stock of your company?

Mr WASHBURN. The total capital?

The CHAIRMAN. That is not giving away a secret?

Mr WASHBURN. Oh, no. It is about $6,000,000.

The CHAIRMAN. How long have you been organized?

Mr WASHBURN. I do not remember just the day of organization. We began commercially manufacturing in 1910.

The CHAIRMAN. What is the output of your plant?

Mr WASHBURN. $2,500,000 to $3,000,000 a year.

Mr HEFLIN. How much money is invested in that plant at Niagara Falls?

Mr WASHBURN. The plant itself, with all our equipment there, of course is approximately $3,000,000.

Mr HEFLIN. If conditions had been favorable here and the company had not moved from the site on the Coosa River to Canada, that money would have been invested in the United States, would it not?

Mr WASHBURN. Yes, sir, and a third more. We had for investment in the United States $4,000,000 at the time we went up there, but we had a small plant that was in Canada at that time.

Mr. HEFLIN. But the money that is invested in Canada would have gone to the South to Alabama, if my bill had become a law?

Mr. WASHBURN. Yes, sir.

Mr. MCLAUGHLIN. Mr. Washburn answered that he had no knowledge of the investment on the Coosa River.

r. HEFLIN. Oh, no; you did not. Did you?
r. WASHBURN. No, sir.
r. HEFLIN. Mr. Taft vetoed my bill which passed the House, and veto prevented this development on the Coosa.
he CHAIRMAN. You say you have been owning this plant at gara Falls since 1910?
Ir. WASHBURN. Since 1910.
he CHAIRMAN. Do you also control the one on the Canadian side?
Ir. WASHBURN. This is the one on the Canadian side. There is e in the United States.
he CHAIRMAN. None in the United States at all?
Ir. WASHBURN. None in the United States at all.
he CHAIRMAN. You are getting your power at $40 a horsepower.
Ir. WASHBURN. What is that?
he CHAIRMAN. What are you getting your power for?
Ir. WASHBURN. We pay $10.50 for continuous horsepower.
he CHAIRMAN. If you came across the river, how much would you e to pay?
Ir. WASHBURN. On this side of the river?
he CHAIRMAN. Yes.
Ir. WASHBURN. I do not suppose we could get it for less than $16.
he CHAIRMAN. And that difference would wipe out any profit to u?
Ir. WASHBURN. Oh, no; it would not wipe out all of the profits, it would leave us in a position where we could not continue the nufacture as cheaply as we are now doing.
he CHAIRMAN. Let me ask you this: Is there opportunity in this ntry to-day for private capital to invest in these plants and make easonable profit upon their investment?
Ir. WASHBURN. I do not know of any?
he CHAIRMAN. You said a moment ago that if you moved across river and paid $16, you could make a profit.
Ir. WASHBURN. Oh, yes; we might make a profit.
he CHAIRMAN. You are figuring on present prices?
Ir. WASHBURN. Yes.
he CHAIRMAN. Of course I am figuring on normal prices.
Ir. WASHBURN. I do not mean war prices. We can manufacture his side and have a profit.
he CHAIRMAN. Are there any other places in this country at which ant might be located with private capital and turn out this product make a profit on this investment?
r. WASHBURN. It can under present normal conditions.
he CHAIRMAN. Not under present normal conditions, because they ot normal conditions; they are abnormal conditions.
r. WASHBURN. Under normal conditions that do not apply to the re?
he CHAIRMAN. Yes.
r. WASHBURN. Yes, sir.
r. RUBEY. I understood the gentleman to say that he had the t of the process. How is anybody else going to do the work?
r. WASHBURN. I think the chairman did not intend to include profit.
he CHAIRMAN. No; I did not. What I am trying to get at, Mr. hburn, and to get it into the record and for the information of the

[illegible]

Mr. WARREN. Yes, under such conditions as existed [illegible] of the war, but such an investment would [illegible] that length of time that investments must be made [illegible] what we may anticipate as to future conditions.

The CHAIRMAN. Why not? What anticipations [illegible] that existed before the war?

Mr. WARREN. Because the development of the nitrogen supply [illegible] must come from producing it cheaply [illegible] farmers will be induced to use nitrogen where we can not [illegible] and we want it in greater quantities in places where [illegible] to and you are not conducting a great business. [illegible] improvement without cutting the costs, particularly in the case of [illegible] and here, about 50 per cent. I believe.

The CHAIRMAN. The output from such a plant in this country, Mr. Warren, would be your statement, would find a market to the extent of [illegible],000,000 or $60,000,000 a year, [illegible] phosphoric acid. That is a pretty big market, [illegible]

Mr. WARREN. That is a pretty big market.

The CHAIRMAN. Now with that kind of a market, can private [illegible] one of those plants and make a reasonable profit, [illegible] but under normal conditions?

Mr. WARREN. Well, you must repeat that question, so I can get the [illegible]

The CHAIRMAN. I say with a market for the output of such a plant [illegible] between $55,000,000 and $60,000,000 [illegible] private capital can invest in that kind [illegible] with any assurance of a reasonable profit upon its [illegible]

Mr. WARREN. Will prices such as they have been in the past?

The CHAIRMAN. Yes.

Mr. WARREN. Yes.

The CHAIRMAN. They are low?

Mr. WARREN. Yes.

The CHAIRMAN. Then, now, what is the reason for the proposal [illegible] to furnish these superstructures, [illegible]?

Mr. WARREN. Because, in order that the business can be conducted [illegible] we have got to have the cost of your product [illegible]

The CHAIRMAN. What reason is there now in the world?

Mr. WARREN. What reason? Do you mean [illegible] [illegible] [illegible]

The CHAIRMAN. [illegible] and I suppose that is [illegible]

Mr. ANDERSON. Do you mean, Mr. Washburn, that because you crease the world's production by a very large amount that you ust therefore produce your product more cheaply?

Mr. WASHBURN. I mean that in order to induce the market to rchase you must give the product to the user very much cheaper an we can at the present time.

Mr. HEFLIN. A Government aid would enable them to manufacture ore cheaply and therefore to sell more cheaply to the farmer.

Mr. WASHBURN. Undoubtedly.

Mr. MCLAUGHLIN. You were speaking of the assurance that the mpany must have of being able to control the field secured in the arket—that is, for the future—and, of course, you have in mind me or perhaps all of the methods that are used by foreign coun- ies, perhaps Germany in this particular instance, to control the ice and monopolize the market. Now, we try never to talk politics this committee, but might it be advisable or necessary sometimes the future, if the Government goes into this with you, to furnish otection by way of customs duties, or otherwise protect you? I ink that is a proper question.

The CHAIRMAN. That is proper; yes. I would like to ask him ie right following it, however.

Mr. WASHBURN. I think the day has passed when a duty will er be placed on food that you put in your mouth, and the nearest ing to it is fertilizer. I should consider it the remotest possible olitical contingency.

The CHAIRMAN. I might ask in that connection, Mr. Washburn, I understood you correctly awhile ago to say that the Canadian trogen industry was built up by admitting the machinery for that oduct free of duty?

Mr. WASHBURN. The machinery for the initial development was lmitted duty free.

Mr. STEELE. Mr. Chairman, now, as I understand, it is simmered wn to this proposition. If the Government builds these two rticular dams—these factories—and appropriates $20,000,000 r that purpose, then you put in your plant. Now, after the war over, as I understand, you say that you can produce these articles cheaply as Germany, so that you could compete. That is the ought, isn't it? That if the Government would loan you this oney, or, in other words, build this dam, at a 3 per cent rate, then ou would be in condition to furnish these nitrates as cheaply as ermany will after the war?

Mr. WASHBURN. Yes.

Mr. STEELE. That is the whole situation.

Mr. HELGESEN. If the Government or anyone else furnishes you ie power to expand your industry as you want it to be expanded, hat price could you afford to pay annually per horsepower for that ower?

Mr. WASHBURN. The present suggestion works out about $5.

Mr. STEELE. But yet you are paying $10.50 in Canada and operat- g successfully?

Mr. WASHBURN. Yes.

Mr. STEELE. Why the difference?

Mr. WASHBURN. Because power does not constitute the entire st, and we would expect that the product would come down, so

[illegible]

[illegible]

[illegible]

r. HELGESEN. I understand in Norway they are waiting for these nts to expire, and that that is going to benefit the industries much. Is that a fact?
r. WASHBURN. I do not know how much it will benefit the stry. The commercial feasibility of a patented process does not nd altogether upon the fundamental patents. It depends upon mprovement patents. I will give you an example. When this ess was taken over and we began in 1910, we had a guarantee as osts. We have reduced the direct costs by 40 per cent under nts that we have taken out since the fundamental patents. ody could possibly compete with us whose product would cost one and two-thirds times as much as our product cost. So the nt situation, we believe, is very strong.
he CHAIRMAN. Now, Mr. Washburn, suppose the Government rtook to do what you propose that it should do. How long d it be before these various plants could begin operation?
r. WASHBURN. For preparedness reasons it would be desirable uild an initial installation of steam, not for the entire amount of r by any means, and then the waterpower would follow, a part in the course of two and a half to three years, and the remainder in the course of four to four and one-half years. We can be y to give the Government such preparedness as it needs, in the ment I believe of the War Department, in a year after any arrange- shall be consummated.
r. HEFLIN. One question, Mr. Chairman. Now, your opinion is, Washburn, if the Government will render this aid which you sug- that a sufficient supply of nitrogen for all purposes of the United es can be manufactured in the United States and at a much lower to the farmer?
r. WASHBURN. Yes.
r. RUBEY. I thought he said that they could manufacture about half of the amount of nitrogen needed.
he CHAIRMAN. Mr. Washburn, the committee is very much ed to you for your very interesting statement.
r. McLAUGHLIN. For my own information, or perhaps because ny being the only one willing to show his ignorance—what is the f a patent that you have?
r. WASHBURN. The life of patents in this country, you mean?
r. McLAUGHLIN. Yes.
r. WASHBURN. Seventeen years.
r. McLAUGHLIN. And that applies to all of the different patents have, originally granted you?
r. WASHBURN. Yes; it applies to every patent, but the patents come in from 1905 up to the present day.
r. RUBEY. What is the date of your patent?
r. WASHBURN. You mean of the patent?
r. RUBEY. Yes.
r. WASHBURN. We have not any single patents. We have about ndred patents.
r. RUBEY. And then the next year, and the next year, you would additional patents, so that the time never would come——
r. WASHBURN (interposing). We do not propose that it ever shall when anybody can compete with us, if it is within our power.
r. HAUGEN. I understood you to say that the Government would power to fix the prices on the output of these nitrates?

[illegible] proposition?

[illegible] exorbitant prices.

[illegible] the power by

[illegible] exorbitant prices.

[illegible] that the prices

[illegible] It is a very com-

[illegible] anyhow, that would

[illegible] you said that it

[illegible] What returns would that

[illegible] percentage?

[illegible] a good deal involved

[illegible] a reasonable profit on

[illegible] that. I do not know.

[illegible] which you suggest to be

[illegible] reasons. I should

[illegible] know at the moment what

[illegible] the price that the farmer

[illegible] the article.

[illegible] the investment.

[illegible] two factors.

[illegible] a reasonable profit? The

[illegible] a reasonable profit on the invest-

[illegible]

Mr. [illegible] manufacturing industries that are going, like [illegible] and things of that kind, in [illegible] the expenses of the manufacturing in years [illegible] the big overhead expenses, and all [illegible] figure on 15 per cent. Lots of concerns [illegible] per cent.

Mr. HAUGEN. Not profit year after year?

Mr. WASHBURN. Not profit year after year.

Mr. HAUGEN. What rate of interest on the bonds?

Mr. WASHBURN. That is bond interest generally—say, 6 per cent.

Mr. HELGESEN. Before we close, we have the Farmers' Union and the National Grange, and they would like about five minutes, and I think that we could give that to them now.

STATEMENT OF MR. R. F. BOWER, REPRESENTING THE FARMERS' NATIONAL UNION, CHARLOTTESVILLE, VA.

Mr. BOWER. We simply want to state that we do not want to see this great nitrate industry turned over to commercial enterprises in this country without the Government going into it far enough to [illegible] control over the possible development of an air-nitrate competition with the Chilean nitrate monopoly, and so

as we are concerned, we believe that the only solution of this blem that we will be satisfied with will not be commercial enter- es developing the power and turning us over completely to their cy, but that the Government take such part in the development this project as to insure Government control and Government ilation in some form that may work out through legislation.

Mr. HEFLIN. This cooperative plan suggested by Mr. Washburn?

Mr. BOWER. I think that would entirely meet with our approba- if the details could be worked out. The general process would irely meet our requirements.

Mr. HAUGEN. You mean for the Government to furnish the money build the dam?

Mr. BOWER. Yes, sir.

Mr. HAUGEN. Nothing short of that?

Mr. BOWER. Nothing short of that.

STATEMENT OF MR. L. C. CROWE, MEMBER OF THE NATIONAL BOARD OF DIRECTORS OF THE FARMERS' UNION, FROM THE STATE OF WASHINGTON.

Mr. CROWE. I understand a good deal about the power that the tleman spoke of in Washington on the Columbia River. I would that we took this matter up among our legislative matters, and t we agreed upon what Mr. Bower here has said, and I was about say, as a representative of the Farmers' Union, that I would be ch better satisfied if it could be done that the Government would e over the entire operation of the plant and the entire operation all of it, but I see, under the circumstances, the way they are ated at the present time and the patent for a secret process and those things, it seems to me the most feasible plan is what has n outlined here, and so we have agreed on that. We have orsed that kind of a matter, with the understanding that the Gov- ment should limit the price, should limit the price that it should sold for to the farmer; that they should supervise it by Govern- nt control of it, and that is the understanding with the National ion.

Mr. HEFLIN. So as to prevent unreasonable prices?

Mr. CROWE. Yes, sir; so as to prevent exorbitant prices to the mer.

The CHAIRMAN. Is there any one here from the National Grange o desires to be heard for a moment or for any length of time?

Mr. BOWER. I can add to that that this resolution was adopted in nt session with the Farmers' Union and the National Grange.

The CHAIRMAN. So that you two speak for the two of them?

Mr. BOWER. Yes, sir.

(Thereupon the committee proceeded to the consideration of other siness.)

...OUSE OF REPRESENTATIVES.
...COMMITTEE ON AGRICULTURE.
Tuesday, February 1, 1910.

...HEARING.

...The committee met at 3 o'clock p. m.

...STATEMENT OF DR. L. O. HOWARD, CHIEF OF THE BUREAU OF ENTOMOLOGY.

...page 138 of the Book of Estimates, the Bureau of Entomology. Dr. Howard, we will ... and tell us about that.

... I see you have one administrative ... from the lump fund for moths. ... a transfer to the statutory roll ...

... lump sum reduced by the same amount!

... is a corresponding reduction in the ...

... clerks of class 1, an ... fund for miscellaneous in-

... In these cases, two clerks ... increase in the statutory roll, with a cor- ... lump funds.

... where you have an increase of ... from lump funds for cereal ... insects, and truck-crop insects. ... the way through, putting ... corresponding reductions in the ...

... the same!

... the same!

... That is the same. That and the following items re- ... have been carried on the lump funds. The ... essential to the Secretary, and he has decided this year, ... to your principles in this respect, that these per- ... should be put on the statu-

The CHAIRMAN. What do they do?
Dr. HOWARD. They are engaged in preparing specimens; they also ke certain notes and assist in some of the laboratory work. Prin- ally their work consists in preparing specimens for the collections.
The CHAIRMAN. And they are permanent employees?
Dr. HOWARD. Yes, sir.
The CHAIRMAN. Item 16, on page 134, there is an increase there of o preparators.
Dr. HOWARD. Only by transfer from lump funds, just the same as th these other items.
The CHAIRMAN. And item 17, you have a number of increases ere?
Dr. HOWARD. They are also by transfer.
The CHAIRMAN. In item 19 you say two messengers or laborers, at 00 each, by transfer of one messenger at $900 from lump fund for scellaneous insects, and one unskilled laborer at $900 from lump nd for forest insects, with change of title.
Dr. HOWARD. Yes, sir; two messengers or laborers from one mes- ger and one laborer. The idea is to give a little more latitude, a messenger might refuse to do a laborer's work, and a laborer ght refuse to do a messenger's work. If they are designated ssenger and laborer each will have to attend to the duties of those sitions.
Mr. ANDERSON. How many messengers have you in your bureau?
Dr. HOWARD. I think there are four in Washington and one or o—several, perhaps—at some of the field stations. I can not tell u exactly.
Mr. ANDERSON. Are there any additional messengers on your lump nds which are not now transferred to the statutory roll?
Dr. HOWARD. I think they are all brought in on the statutory roll these items. I am not quite sure, though.
The CHAIRMAN. In item 20, Doctor, you have some transferred and hange of designation, also.
Dr. HOWARD. Yes, sir.
The CHAIRMAN. And those in 21 are transferred?
Dr. HOWARD. Yes, sir.
The CHAIRMAN. And in item 22 you have one messenger boy sub- tted, $480 per annum.
Dr. HOWARD. Yes, sir; one additional messenger.
The CHAIRMAN. What have you to say about that?
Dr. HOWARD. Nothing at all, Mr. Chairman, except that we need other messenger boy. The messenger force is rather restricted d our bureau is a large one. Frequently one of the men will ring r a messenger and there is no one to answer. We simply need other one.
The CHAIRMAN. You have five messenger boys now and you want t.
Dr. HOWARD. Yes, sir.
The CHAIRMAN. These other messengers, called messengers or borers, they now do both kinds of service?
Dr. HOWARD. Yes, sir.
The CHAIRMAN. Any questions on that item, Mr. Anderson?

...and 50?

...are all by transfer from ... funds.

...ase the general statement that in all

...transfer to the statutory roll there has

...in the lump fund?

...Yes, sir.

...In the salary in none of these places has

...se whatever.

...ositions on the statutory roll, gentlemen!

...general expense items. I want to say that

... Kentucky has asked me to submit to the

... brief statement in connection

... and without objection we will

...w

STATEMENT OF HON. ROBERT YOUNG THOMAS, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF KENTUCKY.

Mr. ... now, there is not a member of ... of the large tobacco-raising States ... members on this committee from Iowa ... committee is made up of Mem... States. The large tobacco-raising States ar... committee, and what I want to talk to yo... for what is called the tobacco hornworm.

... gentlemen.

Mr. ... tobacco worm. The appropriatio... I think that was the amoun... sufficient, I am informed, fo... using the remedy they pr...

... of lead, which it ha... testing the worms. It has been th... this frequently hurt ... the operator. Bu... of lead is sometimes harmles... from that will enable th... restrictions on the use of this remed... tobacco-growing States. I think the use of this remed... confined to the States of Kentucky and Tennessee

ason that the appropriation is not sufficient to give demon-
in all the tobacco-raising States like Virginia and North
and the other States that raise tobacco in limited quantities.
mation is that we ought to have as much as $30,000 to make
e demonstration of the efficiency of this remedy throughout
d States.

ELGESEN. What kind of demonstration?

HOMAS. To send men out in the tobacco sections and show
ers how to use this remedy.

ELGESEN. Don't you just sprinkle it on, the same as you do
en?

HOMAS. Not exactly. It has to be mixed up in some way,
put on with a sprinkler. The farmers won't take it up
these demonstrations. They took a great interest in the
ations in my State, and especially in my district; there were
number made in my own district. When they advertised
matter was to be demonstrated the farmers flocked in to
his new remedy was used.

ELGESEN. Do they know how to use Paris green?

HOMAS. To some extent, but they will not use this new remedy
ese demonstrations are made and they become interested in
way; they don't know about it now in many of the tobacco-
ections, and they simply won't take it up unless the depart-
s out there and makes these demonstrations.

REELE. You say they have demonstrated that this is a good
for the prevention of worms. If it is all laid out in the
a bulletin, could they not go on with it after reading how
l?

HOMAS. Oh, you know how people are; they won't do it;
e to have a demonstration. That has been the experience of
rtment; they have to give them these demonstrations before
l take it up. It has been of great benefit to the tobacco-
ections where it has been tried, and it seems to me $30,000
nly a very small appropriation to make in the interests of
co people of this country.

REELE. How much did you say was appropriated last year,
mas?

HOMAS. Seventeen or eighteen thousand dollars; I forget
t amount. This matter has also been taken up by various
iversities, where the students of entomology have done this
demonstrating the remedy themselves; there were three or
nonstrations in my district last year, and they have been of
nefit.

OWELL. Does the State of Kentucky appropriate any money
ying on this work?

HOMAS. I could not tell you about that, or whether it has
ed for such an appropriation. They have a bureau or some-
that order, and possibly it does, but I can not answer that
. But I think the appropriation asked for is small for the
of benefit to be conferred. Tobacco is one of the greatest
the country. The largest production is in the State of
y. We raise 300,000,000 pounds of tobacco in Kentucky
erage every year, which is one-third of the entire crop raised
nited States. Of course, Virginia and North Carolina and
ates raise a great deal of tobacco, but it is a pretty hard

[illegible] Does the Government know the State how to use [illegible]

[illegible] Mr. Chairman, I do not think that has been [illegible] Entomology that sells the men [illegible] will now to make [illegible] make [illegible] the Dominion Government [illegible] the Dominion does [illegible]

Mr. [illegible] There is getting to be too much of that now.

Mr. [illegible] have to talk to Mr. [illegible] other gentlemen [illegible] from the [illegible] States [illegible] I do not think [illegible] the Government to [illegible]

[illegible] They have found that the [illegible] is very effective in killing to[illegible] but the [illegible] does not know how to apply it. He might [illegible] but without a [illegible] will not take it up. That is what the Government is now trying to do and that is what we want.

[illegible] in Kentucky, you [illegible] the high [illegible] lowlanders.

[illegible] sent some of them to the [illegible]

This [illegible] is an important one [illegible] all use it, I guess, [illegible] I ask for an appropriation [illegible]

[illegible] to you, Mr. Thomas.

STATEMENT OF C. L. MARLATT, IN CHARGE OF DECIDUOUS FRUIT INSECT INVESTIGATIONS.

[illegible] Howard. We will take up item 34, on page [illegible] "For investigations of insects affecting deciduous fruits, orchards, vineyards, and nuts."

Dr. Howard. It seems to be your plan this year, Mr. Chairman, to have the man in direct charge of a particular branch of our work explain to the committee the items pertaining to it. And as this next item, No. 34, pertains to the investigations of insects affecting deciduous fruits, orchards, vineyards, and nuts, which are under Dr. Quaintance, I will ask you to hear him.

The Chairman. All right.

Dr. Quaintance. Mr. Chairman and gentlemen of the committee, I want briefly to mention some of the lines of work now under way, and I think the best way to do this will be to refer to our Program of Work.

The Chairman. We will be glad to have you proceed that way, sir.

[illegible]NTANCE. This office deals with orchards, vineyards, and fruits representing a crop value of some $175,000,000

ılly, as based on the last census figures. As 20 to 40 per cent
e fruit crop is destroyed by insect attack, the importance of
ork is seen.
have a number of projects which are being carried out at field
ns. I should explain that in work of this kind we must neces-
go to the orchard or vineyard, where these troubles are in
nce; so we have established field laboratories in various fruit
ns—New Jersey, Michigan, New Mexico, California, Washing-
ınd other places—where this work of the bureau will be most
ceable to the greatest number.
ferring first to the project of apple insect investigations, please
the title of apple-tree borers. The injuries of fruit-tree borers,
e aggregate, are very important, and the different species are
difficult to control on account of their habits. Investigations
ests of remedies have been going on for a number of years. Our
atory for the investigation of fruit-tree borers is located at
:h Creek, W. Va., where conditions are favorable for the work.
e of the principal apple-tree pests, and one which is generally
buted throughout the apple-growing region of the eastern
d States, is the so-called round-headed apple-tree borer. This
is especially destructive to young orchards—those from 3 to
ars old. I have here a few photographs [showing them] which
rate the damage caused to apple trees by this pest.
ere are certain other borers of apple and other fruit trees which
ıe primary cause of premature decline of trees. This old apple
showing picture] was destroyed by a species of borer getting
he tree through wounds and injured places and destroying the
or tissues, with the result that the tree was destroyed by the
Otherwise, it might have lived for many years. Another
s is shown here [exhibiting picture]. This picture [exhibiting
graph] shows a recently discovered pest of young apple trees;
ee trunk being shown in cross section. There are numbers of
pest constantly coming in to orchards from other food plants,
I think this condition will always exist as new territory is
d up.

The CHAIRMAN. In this apple-tree investigation do you find that borers attack the body of the tree generally?

Mr. QUAINTANCE. Yes, sir; some attack the twigs and branches, ıis injury is comparatively light.

The CHAIRMAN. How about the roots of the trees?

Mr. QUAINTANCE. We have no root borers of the apple in this ry.

The CHAIRMAN. Have you discovered, so far, any remedy which ctive against these borers?

Mr. QUAINTANCE. Yes, sir; the apple-tree borer is best controlled e use of certain paints. The trouble has been to find a paint ı will not injure the tree, and such work requires a number of There have been many washes and paints offered, but nearly them have proved injurious to the trees, or ineffective.

The CHAIRMAN. But you are studying now to ascertain the best ly?

Mr. QUAINTANCE. Yes, sir.

Mr. OVERMYER. Is that the same borer that affects cherry trees?

Mr. QUAINTANCE. No, sir; that is another one.

[illegible]

[illegible]

[illegible]

peculiar trouble has shown up in the apple orchards of the Pacific hwest, an affection known as stigmonose, and the bureau has investigating it, cooperating with the Bureau of Plant Industry. have a laboratory at Wenatchee, Wash., where studies are r way to determine the relation of insects to this affection he fruit. In this connection we are finding plant diseases that distributed by insects; this relation was especially evident last in the outbreak of pear blight.

r. HAWLEY. You have not yet discovered anything for pear ht?

r. QUAINTANCE. No; that is a disease that is handled in the eau of Plant Industry, but the Bureau of Entomology is inter- d in it on account of the dissemination of the disease by insects. he next project is that of peach-insect investigations. Our work ow mostly confined to an effort to determine the life history and its of the peach-tree borer. This pest is widely distributed over country, and it causes a loss of five or six million dollars every r. This borer, like those of the apple tree, has been the subject great many recommendations as to the best ways of eradicating ut the principal method has been the digging-out method. This licating] is a picture of a large orchard where the help are shown ging out the borers; the cost of worming trees in this way in the ted States is very large—a couple of million dollars a year, aps.

r. HAWLEY. You can not control this in the same way that woolly le aphis is controlled?

r. QUAINTANCE. We think so. Our experiments have been very essful along that line. We believe the carbon-bisulphid treat- t, with reasonable care, will be safe enough to put in the hands nyone.

he next project to be referred to is the grape-insect investigation. grape Phylloxera did not attract attention in this country until id made its appearance in Europe and had been returned to this ntry—to California and the Pacific coast—with European grape s. The Phylloxera in California at the present time infests most he old vineyards, which are being grown on *vinifera* roots. In ly planted vineyards vineyardists are using resistant roots. Our ratory is located at Walnut Creek, Cal., and there we are work- out the life history of the grape Phylloxera and are giving a t deal of time to study of methods of control in vineyards.

ese pictures [exhibiting] show vineyards in various stages of ine. Here [indicating] is a picture that shows vines with lloxerated roots that have been pulled up. We are experiment- in cooperation with the Bureau of Plant Industry, on resistant s.

anting vines with resistant roots is the real cure for phylloxera. wish, however, to help maintain in condition the vineyards now he old roots, and we have undertaken certain renovation experi- ts, which involve plowing, fertilizing, and the use of soil fumi- s.

ur results have been fairly satisfactory along that line, but fur- studies of relative benefits and comparative costs must be made. nother insect to which we have devoted especial attention is the e berry moth. For some years this has been unusually abundant

[illegible] societies, particularly in the [illegible] [illegible] [illegible] [illegible] We have studied the [illegible] [illegible] [illegible] [illegible] from the point of the [illegible] [illegible] [illegible] we have not been able to carry on [illegible] [illegible] [illegible] as we wish, for the reason that in the [illegible] [illegible] where this investigation is under way [illegible] [illegible] occurrence. Our results therefore [illegible] [illegible] conclusive. We have, however, [illegible] [illegible] lines of work—spraying [illegible] [illegible] and the covering up of [illegible] [illegible] We now have under way at North East, Pa. [illegible] [illegible] these three lines, which should be continued [illegible] [illegible] make the results cumulative.

The control of the grape berry moth is troublesome and we [illegible] [illegible] investigation before it is worked out.

Mr. CRUMPACKER. You will remember, I think, some correspondence [illegible] [illegible] the grape berry moth in northern Ohio. I am [illegible] [illegible] this item, and I wanted to ask if you [illegible] [illegible] station in Ohio or any representative of your [illegible] [illegible]

Dr. QUAINTANCE. No, sir.

Mr. CRUMPACKER. Will this appropriation you ask for [illegible] [illegible] [illegible] station in northern Ohio?

Dr. QUAINTANCE. No, sir; we could not establish an additional [illegible] [illegible] funds now available.

Mr. CRUMPACKER. Are you familiar with the situation in northern Ohio?

Dr. QUAINTANCE. Yes, sir.

Mr. CRUMPACKER. What is the situation there with reference to the grape berry moth?

Dr. QUAINTANCE. It is very severe in northern Ohio, for reasons not [illegible] I can not see why it should be so destructive there, but it is. To our personal knowledge, the grape-berry moth is especially abundant in northern Ohio, and we have had for a number of years complaints from the growers who are unable to control it. Some vine-yardists have stated that they would be forced to quit grape growing unless conditions were improved.

The CHAIRMAN. You say it is more destructive there?

Dr. QUAINTANCE. Yes, sir; but why, I do not know.

The CHAIRMAN. Why have you not established a station there?

Dr. QUAINTANCE. The station at North East originally was placed there to undertake a study of the grape root worm in Pennsylvania, and our grape berry moth work was incidental to other investigations going on. If we had funds to establish an additional station in northern Ohio, we should have better berry moth conditions for experiment.

Mr. CRUMPACKER. How many men do you have in that work?

Dr. QUAINTANCE. Only one man on the grape-berry moth proper; [illegible] one man working on berry moth parasites.

The CHAIRMAN. Have you practically completed that work in Pennsylvania?

Dr. QUAINTANCE. We have not. We have only had our principal [illegible] experiments going on for one or two seasons, and these should

inued; the work is of such a character that to get final results, ill be of value we should continue there in the North East ; on the plats now being used.

OVERMYER. What has been your success in New York and lvania where you have established field stations in connection ıe grape-berry moth investigations?

QUAINTANCE. We have not been entirely successful. We have ation as to methods of treatment which leads us to believe we ve better success in the future.

OVERMYER. You had some beneficial results there?

QUAINTANCE. Fifty or sixty per cent benefit, but that is not ch as we should have.

CHAIRMAN. How much money would you require if you were a station in northern Ohio?

QUAINTANCE. We ought to have $3,000 or $4,000, I should say.

)VERMYER. I have had a large amount of correspondence with the growers from northern Ohio on this proposition. The grape ry of Erie County and the islands adjoining alone totals nearly ,000, according to figures they have submitted, and they claim ithin the past four years there has been a loss of two-thirds of)p owing to this pest. They claim, also, that if it is not checked lustry will be destroyed. I noticed in your bulletin issued here ou say a great damage is being caused in northern Ohio by this nd what I should like to ascertain from you is whether this)riation would enable you to establish a land station there this g season.

QUAINTANCE. No, sir.

OVERMYER. Then, what additional appropriation would be ed to provide for such a station?

QUAINTANCE. I think $3,000 or $4,000 would enable us to do it.

OVERMYER. I might say, in that connection, that the situation come acute only within the last year. The Ohio Experiment a has a man out at Gypsum, and I have a letter from him, the)r of the experiment station, under date of January 22, in he says it will not be possible for them to do any additional here at all, and that they would welcome the cooperation of ıited States Bureau of Entomology if they would enter the ıd would be glad to work with them.

QUAINTANCE. The bureau would be glad to cooperate with the Experiment Station.

OVERMYER. You consider the situation in northern Ohio as to ıpe industry quite serious?

QUAINTANCE. I think they should have help; without it, it is though they are going to be forced to quit grape growing.

CHAIRMAN. All right, Doctor, take up the next item.

QUAINTANCE. We have under way in the South an investiga- f pecan insects covered by the next project. The pecan in- is becoming a very important one. This tree, being a native to the hickory, has been attacked by a number of pests that the hickory, in addition to those peculiar to pecan itself, and ıust be controlled if successful pecan culture is to be carried on. ation is in Florida, where work has been under way for three s, and we are making distinct progress in getting data on the and in developing remedies for their control.

[illegible]

Spraying apparatus and spraying efficiency: The manu
spraying [illegible] is a very large industry
[illegible] spraying [illegible] years—about thir
[illegible] growers, entomologists, and others in t
[illegible] millions of dollars fo
[illegible] spraying machines has
[illegible] has depen
[illegible] knowledge that
[illegible] suited to their p
[illegible] The wi
[illegible] machines has become
[illegible] in with the Bureau
[illegible] Rural E
[illegible] different kin
[illegible] material improven
[illegible]

[illegible] investigations is the n
[illegible] years the investigated cranb
[illegible] Wisconsin and a report in course of preparation. T
[illegible] New Jersey, where the wo
[illegible] being prosecuted with
success.

The [illegible] destructive insects by natural age
study involves the use of parasites for destroying insects a
the rearing of parasites and their liberation, the use of
insects, and the culture and dissemination of fungous
insects. We have had some phases of this work under wa
time, and the results promise to be very beneficial. The
sery stock each year due to various insects is very heavy
large nurseries one may see from 20 to 30 per cent of the
thrown out due to woolly apple aphis alone. We are try

Mr. LESHER. The work you are doing is excellent work, but what n you tell us now as to the practical results of your work from an conomic standpoint? How much money are you able to save the ople by your bulletins in which you give them the result of your ork and all that sort of thing?

Dr. QUAINTANCE. I believe we are able, if our recommendations e followed, to save from 50 to 80 per cent of the value of most ops.

Mr. LESHER. That is what I wanted—a practical idea of what u were doing.

Dr. QUAINTANCE. I believe that statement will be admitted by yone who is familiar with our kind of work.

The CHAIRMAN. Any further questions? If not, we will proceed, r. Howard, with item No. 35.

'ATEMENT OF DR. L. O. HOWARD, CHIEF OF THE BUREAU OF ENTOMOLOGY—Continued.

The CHAIRMAN. There is an apparent decrease there of $4,840, ie to transfers to the statutory roll.

Dr. HOWARD. That is the same amount as last year, Mr. Chairman. These investigations have been under the direct charge of Prof. Vebster, who died last month. The work is carried on in much ie same manner as other branches of the bureau—by means of ld stations in different parts of the country.

The CHAIRMAN. Maybe you could tell us what is being done under ch of the headings, beginning on page 317 of your Program of Vork. Are you familiar with the details of the different projects?

Dr. HOWARD. Yes, sir; I have been looking into the work of this ction and have visited a number of their field stations lately, so am familiar with the work they are carrying on.

Under the head of the "Hessian fly," I would say that we have been aking a country-wide survey with regard to this pest. After a udy of the matter we have succeeded in mapping out a schedule at will enable the farmers in different parts of the country to me their sowing in order to avoid the damage that may be done this Hessian fly. We have a bulletin that will give a farmer the proximate date for his particular section, and if he will follow our commendations he will avoid any serious damage.

Mr. ANDERSON. How prevalent is the Hessian fly?

Dr. HOWARD. Practically all over the wheat-growing regions of the nited States. For a long time in the spring-wheat regions it was ot found, but now it extends to the Pacific coast. The principal mage caused by this Hessian fly is in the Middle West. There are her insects of that same group which attack wheat; they are in-uded in the next item, under the heading "Dipterous enemies of rains other than the Hessian fly."

Cutworms are a great pest to the average crops. There are dif-rent laboratories established throughout the United States for the udy of the particular species involved, and the same may be said regard to the project which follows, under the head of the corn-af aphis.

The chinch-bug problem is one that requires constant watching, so to enable us to foretell where the chinch-bug is likely to break

out and become very injurious. We have therefore established stations in different places, where we are prepared to tell the farmers when to begin their chinch-bug work. Recently in Kansas we were able, at just the right time, to advise the farmers to burn the roadside grasses when it was discovered that these bugs were congregating in enormous quantities; in this way we were enabled to prevent an outbreak in that part of the country.

Mr. ANDERSON. Can you stop an outbreak of the chinch bug when it once gets started?

Dr. HOWARD. When it once gets started, Mr. Anderson, it is a difficult thing to control. These bugs migrate rapidly from wheat to corn, and it is very much better to anticipate an outbreak and by the mere burning of the roadside grasses destroy the hibernating bug.

Mr. DOOLITTLE. Will sleet or cold water kill the chinch bug?

Dr. HOWARD. It won't kill the egg. If we have a very wet spring it is likely to stop the outbreak. If they promise to be hibernating in large numbers, and if you have a cold, wet spring, they will not become as numerous as they threatened to be. Certain bacteria and certain fungous diseases will develop under a condition of moisture with the chinch bug, just as the pneumonia germ develops with human beings.

The CHAIRMAN. How long do chinch bugs last or continue when there is an outbreak?

Dr. HOWARD. I do not remember two very serious outbreaks where one followed the other. As a rule, they do not appear very largely after a season in which they were in tremendous abundance?

Mr. DOOLITTLE. Do you know what does kill them?

Dr. HOWARD. Yes, sir; there are fungous diseases that kill them.

Mr. DOOLITTLE. Is there any way you can inoculate them?

Dr. HOWARD. It has been tried but, on the whole, unsuccessfully. The germs of these diseases are normal to the chinch bug.

Mr. DOOLITTLE. So you have never been able to control the chinch bug with any certainty?

Dr. HOWARD. Only by burning off the grass at the proper time. I think last summer there would have been a very serious outbreak of this pest in Kansas if the farmers had not the fall before burned off those roadside grasses.

Mr. HAWLEY. But you have to watch out in order to determine when you should do this?

Dr. HOWARD. Yes, sir; the particular service we render in this matter is to have these men in the different regions, going about on their motor cycles and watching for just these things, which enable us to anticipate when there is likely to be an outbreak.

The CHAIRMAN. What is your method now? Do your men who are out in the field go around among the farms and along the roads to find these places where they hibernate?

Dr. HOWARD. Yes, sir; we have a station at Wellington, Kans., for example, where they are studying all the insects that are injurious to wheat, and they are, incidentally, watching out for the chinch bug. There are three or four men out there, and they go all through the country, into the fields and along the roads, and when they notice any signs of the chinch bug becoming more numerous they make a note of it, and, if a serious outbreak is threatened, they advise the farmers to burn the roadside grass.

The CHAIRMAN. And does the community usually take their advice?

Dr. HOWARD. It did so last year in Kansas.

Mr. HELGESEN. They have known about that for the last 40 years, and it seems to me, when you come down to the point that you go and talk to people about this, you have done all you can. I don't see how we are going to make people do a thing. It looks like a very large waste of money to me.

Dr. HOWARD. That work is done incidentally; there is other research work going on at the same time.

Mr. HELGESEN. Most of this work has been provided for for a long time; we have been carrying special appropriations for work of this kind for 40 years, and I don't believe it is justified.

Mr. STEELE. Could not the meadows be burned off, too?

Dr. HOWARD. It is only a certain kind of grass where the chinch bug hibernates—generally in the clump grasses along the roadside. It is very distinctive and can be readily pointed out.

Mr. DOOLITTLE. Don't they grow up under the fences?

Dr. HOWARD. Yes; in this kind of clump grasses.

Mr. OVERMYER. And along the partition fences as well as along the road fences?

Mr. HOWELL. What are you recommending for cutworms?

Dr. HOWARD. Poisoned bait of one kind or another. You can poison bunches of cut grass or clover. Some of these poison baits are compounds of bran, arsenic, and molasses and water.

The CHAIRMAN. Wireworms come after cutworms.

Dr. HOWARD. There are several different stations for the study of wireworms in various sections of the country. We have recently published a bulletin on wireworms, Department Bulletin 156, "Wireworms."

Mr. STEELE. Can you give a formula for cutworms?

Dr. HOWARD. A most effective measure for destroying the worms without treating the crop is to mix 100 pounds of wheat bran with a couple of pounds of either Paris green or powdered arsenate of lead, or, if these are not obtainable, use 3 pounds of London purple, bringing the mass to a stiff dough by the use of 1½ to 2 gallons of molasses. The addition of three finely chopped oranges or lemons to the above mixture renders it more attractive to the cutworms.

The CHAIRMAN. What is the remedy for wireworms?

Dr. HOWARD. There are remedies given in the bulletin referred to.

The CHAIRMAN. All right, take up the next item.

Dr. HOWARD. These other problems are of a general nature concerning insects of almost country-wide distribution, and at each of these field laboratories all of them are being studied by competent forces.

We are doing a great deal in studying the enemies of the alfalfa crop. The alfalfa seed chalcis and the clover rootworm are being studied with a view to controlling these pests. Most of the pests of the clover plant are practically identical with those of the alfalfa plant.

Mr. HAWLEY. Does the life history of these pests run the same all over the United States?

Dr. HOWARD. It varies according to localities. The alfalfa seed midge made its appearance, for example, back in 1879 in New York, and it became evident all over the State. We discovered that if they

would cut the first crop (or hay crop) 10 days earlier they would absolutely destroy the insect and prevent any damage to the seed crop. Applying this same principle to the outbreaks in the Northwest, we expect to be able to accomplish a great deal by slightly altering the time of cutting the first crop.

Mr. HAWLEY. So it requires considerable study in different localities?

Dr. HOWARD. Yes, sir.

Mr. HAWLEY. We have not only this fly that destroys the seed but a borer that destroys the root.

Dr. HOWARD. Yes; I understand that this combination is a very unusual occurrence. I know of no place where you find that condition except in that locality. It will probably be through a proper rotation of crops that the root borer will be best controlled. They have been growing clover continuously in that part of Oregon on the same land.

Mr. HAWLEY. Mr. Chairman, I should like to make a statement on this subject.

The CHAIRMAN. Certainly.

Mr. HAWLEY. Item 35 of the Bureau of Entomology deals with insects affecting cereal and forage crops. There is a station at Forest Grove, Oreg., where the bureau has done excellent work and has in course of solution several important problems. More money is needed to enable the bureau to prosecute its work at this station. Its work deals with a number of injurious insects and covers a very large area.

The Forest Grove, Oreg., field station of the branch of Cereal and Forage Insect Investigations, Bureau of Entomology, was established in March, 1914. The work at this point was started in response to an appeal made the previous fall by the clover growers of Washington and Clackamas Counties to the Department of Agriculture, in which they stated that their clover-seed crop was being destroyed by an insect, which was later determined by the department to be the clover-flower midge.

Mr. C. W. Creel, an assistant of the bureau stationed at Salt Lake City, Utah, was transferred to Oregon to take up the study of this insect and carry on experiments looking toward its control.

The first work was to commence life-history studies of the insect to determine if its life history was the same in the Willamette Valley as that which had already been worked out in New York and other Eastern States. At the same time, based on his knowledge of the work of eastern investigations, the expert tried out pasturing and early cutting experiments in the clover fields around Forest Grove during the months of May and June, 1914. These experiments were sufficiently successful to greatly reduce the number of midge larvæ and correspondingly increase the seed yield in the fields upon which they were tried that season. At the same time it was demonstrated that there was considerable difference in the life history of the midge in the Pacific Northwest on account of climatic conditions, as compared with the Central and Eastern States. This made it evident that the life history of the insect would have to be worked out in greater detail and economic experiments carried on in the clover

fields through several seasons before entirely accurate information as to method of control could be furnished the farmers.

During his work at Forest Grove in the spring of 1914 Mr. Creel found that another insect, the clover-root borer, was present in the fields in enormous numbers and was working great injury to the clover crop, thus indirectly affecting the seed yields. In July, 1914, he made a trip throughout the Willamette Valley and found the midge and root borer present in injurious numbers in all sections visited. The infestation appeared to be especially severe in Linn County, which section asked the department to carry on experimental work in that county during the following season. The station at Forest Grove was closed for the winter in November, 1914, and reopened in March, 1915.

During the season 1915 work was carried on on life history studies of the midge at Forest Grove and field experiments looking toward its control in Washington, Yamhill, Linn, and Marion Counties. These experiments have been very successful in eliminating the midge and, with a few exceptions to be noted later, have been followed by good clover-seed yields. The work on the life history progressed so well during the season of 1915 that the station is now in a position to try out field experiments looking toward the control of the insect during the coming season.

In addition to the work in the Willamette Valley the station has been obliged to answer calls for help and advice from farmers throughout the Pacific Northwest during the past two seasons. In May, 1914, the expert was called to the Twin Falls district, Idaho, by the clover growers of that section to investigate reports of a midge outbreak; in August, 1914, to central Oregon to give advice on a grasshopper outbreak; during November, 1914, to Montague, Cal., on work of a similar nature; and in April, 1915, to Grant County, Wash., because of a severe cricket outbreak. In May, 1915, Mr. Rockwood made a trip to the Yakima Valley of Washington, where he found the clover midge, root borer, and a seed chalcis fly all present in destructive abundance. During June and July Mr. Creel was obliged to make three trips to western and central Washington to investigate troubles due to the Hessian fly in wheat, wireworms in grass fields, and various clover insects, and in September, 1915, was detailed at Chico, Cal., for three weeks to study an insect injurious to alfalfa. In August, 1915, Mr. Rockwood advised the farmers in eastern Oregon and southern Idaho as to means of controlling grasshopper outbreaks, and in October, 1915, made a trip to Coos County, Oreg., where he found an insect working considerable injury to corn in that section. He also found the clover-root borer injurious in that locality.

In addition to the work on the midge and root borer, the men of the station have worked as time would permit on the following insects which are also injurious to a greater or less extent in the clover fields of the Pacific Northwest: Clover-seed chalcis fly, clover sitones, clover-leaf weevil, clover-root mealy bug, and various plant lice affecting clover.

The work of the station as planned for 1916 contemplates carrying on life-history studies and economic experiments looking toward the control of the midge and root borer under a variety of conditions

... clover-seed sections of the W... to carry on work of a similar ... Wash., if funds will permit. The ... clover station to experiment on ... western cricket and wireworms in the State ... station to do similar work on grass ... general lookout for all insects ... throughout the Pacific Northwest.

... the farmers of Linn and southern Marion ... for the station to take up is the study ... affecting the production of clover seed. In Linn ... where the farmers succeeded in co... the seed crop was often a failure ... insects necessary to fertilize the clover ... made of these beneficial insects and ... propagation in districts where they ...

... and root borer requires the entire ... men if it is to progress at all ... be done on beneficial insects during ... real value is to be done in the ... and other pests in the State of ... force of men employed at the Forest ...

... pests and of the large area the ... work—an area of over ... more is needed for the work of ... additional assistants, and for ... The crops on this area are large in ... for the most neces... ... and distributed. The growers ver... ... may be found and information ... these pests that are injuring o... crops.

... What about the alfalfa weevil?

Dr. Howard. The alfalfa weevil has been under investigation fo... ... The problem is practically solved as to the remedy ... as to the most economical remedy. The remedy of sprayin... with arsenate before and after the first crop is good, but it is done ... expense of about $5 cents per acre; we hope to be able to reduc... that to 20 cents an acre. An alternative that has been suggested ... the pasturing of the first crop. We have a station at Salt Lake Cit... Utah, where, in cooperation with the Office of Farm Management ... hope to make a study of the proper sequence of crops and of farm management under weevil conditions.

The subject of grasshoppers also comes under this heading. M... Chamberlain. Very successful work has been done in the past ye... in regard to poisoning grasshoppers. There was a tremendous ou... ... of these pests in the Merrimac Valley of New Hampshir... ... a great deal of destruction. We have found the rig... ... for the distribution of poison bait, which, if used properly, wi... ... in saving of the crops. There were two outbreaks in Califo... ...: the people out there applied to the State university, but the

nds available for the work. One of our men went out there
they were not migrating in from the foothills, but were
n the alfalfa fields and around the borders of the fields,
ıg some of the farmers to back him with the necessary
mmediately began a new system of distributing the poison,
it in a seed distributer and drawing it through the fields
grasshoppers were. In some places they were found as
ıs 500 to the square yard. Within a few days he succeeded
ely relieving the situation, and at a cost of 22 cents an
work resulted in an enormous saving to these alfalfa

LEY. Did the cricket ever become a pest?
ARD. In the State of Washington there was an outbreak of
ed Rocky Mountain cricket last year. We are going to
ı from our station at Forest Grove, Oreg., there this spring
ith the farmers if it appears that the State experiment sta-
ıt handle the situation.
IRMAN. I see you have been making some study of the in-
ıttack the cowpeas. That is you last project?
ARD. Yes, sir; that is one of the newer studies which have
ırried very far.
AIRMAN. Anything further on that general item? If not,
ıe up the item 36, "for investigations of insects affecting
eld crops, including insects affecting cotton, tobacco, rice,
, and so forth." I notice you have an increase there. Tell
ng of the lines of work you are doing.
ARD. I will ask Mr. Hunter to tell you about that, Mr.

VT OF MR. W. D. HUNTER, IN CHARGE OF SOUTHERN ROP INSECT INVESTIGATIONS, BUREAU OF ENTO-

STER. On previous occasions when I have appeared before
ittee, the very natural question has been asked as to the
n for continuing the investigational work on the boll
iew of the rather extensive study of it which has been car-
r a number of years. We frequently ask ourselves that
Ir. Chairman. This year we took occasion to give our boll-
k overhauling; we decided to look it over thoroughly to
ther we were justified in continuing on the present scale,
ilar scale, or on an enlarged scale. To get special informa-
ıt point the Bureau of Entomology arranged to have two
most outside entomologists in the United States make a
uisiana and other States where our experimental work
ay. One of these men was Prof. H. A. Morgan, now direc-
Tennessee Experiment Station, but who for 18 years was a
the State of Louisiana and connected with the university
ıte. The other man was Prof. G. W. Herrick, professor
ogy in Cornell University, who, until about three years
resident of Mississippi for about 10 years and had been
with the Mississippi Agricultural College. The reports
o independent investigators was to the effect that the work

[illegible] of the plans under which [illegible] account of certain [illegible] it should be enlarged.

[illegible] of the lines of work that is being conducted on the farms of farmers in the boll weevil. One of the important purposes of [illegible] the insect is the hand picking of the squares early in the season before the weevils have become [illegible] This practice which is followed very extensively [illegible] different regions. There is no absolute [illegible] which it is feasible and economical [illegible] The distance the planter might easily [illegible] of this extensive handwork and in [illegible] that might ensue. It was therefore [illegible] series of experiments to determine [illegible] practicable. Experimental fields [illegible] squares, to be begun on [illegible] later dates. Records were kept [illegible] squares picked and the pro- [illegible] through the season. In that way we have [illegible] for determining what [illegible] from that practice. That is a kind [illegible] through a series of years. We [illegible] by any means. No two seasons are [illegible] reactions between climate and the [illegible] apply in one season would not apply in [illegible] becoming of more immediate importance.

[illegible] by Prof. Morgan, to whom I referred a moment [illegible] of the revolution in agriculture that is taking [illegible] and other States, on account of the boll weevil, [illegible] diversification of crops. One of the most important features of that diversification is the planting of hay crops. That [illegible] the cotton plantation supply of labor a great deal heavier [illegible] before.

The hay crops coming on must be harvested about the time the weevil is becoming active. We therefore have a demand for all the labor that is available on the plantation for this new system of diversification at exactly the time when it is most needed in controlling the weevil by the hand picking of the squares. Therefore, the recent developments having brought a new importance into this particular problem, it will have to be worked on until we can reduce our information to definite rules of procedure.

The boll weevil made an unusual advance in the United States this year. The distance covered by flights was greater than in any previous year. A line of work which has been followed by the bureau for many years is in determining the spread at the end of each season. Information is demanded by the States which have quarantines in operation against the weevil and by the demonstration services and others.

Mr. HAUGEN. Why was the flight larger this year than it was in any previous year?

Mr. HUNTER. On account of climatic conditions—the high winds incident to the two hurricanes along the Gulf coast in August and September. For about a week at the time of the principal movement

the weevil, the wind in Alabama blew from the southwest at the rate of 50 miles an hour, on an average. That carried the weevils over about 120 miles within a week's time.

Mr. HAWLEY. How high in the air do they fly?

Mr. HUNTER. That has not been determined accurately, but they go up pretty high. They have been seen flying out of fields surrounded by tall pines, perhaps a hundred feet high, and they can easily soar, I will say, to a height carrying them over a pine forest.

Mr. HOWELL. To what extent is the cotton crop reduced by the boll weevil?

Mr. HUNTER. That varies from the practical annihilation of the crop down to practically a normal crop. I will give you some information on that point by referring to what has taken place in Louisiana in connection with the readjustment of cotton cultures to boll-weevil conditions. Before the insect invaded Louisiana, the most productive lands were the heavy soils—what they called back lands—away from the river. The crop was not only larger there but more regular, but, with the boll weevil, the conditions there made it unavoidable that a late crop was produced. A late crop, under boll weevil conditions, has very little chance. The result has been that those heavy soils, formerly the most productive, have been abandoned as far as cotton culture is concerned. Forage crops and corn are now planted on such lands, and the acreage on the plantation is on the river front. On the river front they are producing, in many parishes, from a half to three-quarters of what they produced before the boll weevil invaded that country, but at a considerably increased expense in production. The hand work, to which I referred a moment ago and which we desire especially to reduce as the result of this investigation, is the important factor there.

Mr. HELGESEN. You have discovered no method of destroying the weevil entirely?

Mr. HUNTER. No, sir.

Mr. HELGESEN. You have found no method of dealing with them except the hand-picking?

Mr. HUNTER. There are numerous other indirect methods.

Mr. HELGESEN. But outside of the cultural methods——

Mr. HUNTER. They are all cultural methods; that is, they have to do with the management of the crop, or disposition and removal of the crop.

Mr. HELGESEN. What is the difference between the sea-island boll weevil and any other?

Mr. HUNTER. It is the same boll weevil, but the sea-island cotton is radically different, not only in height of growth but in the region where it is grown, from the ordinary upland cotton. Sea-island cotton, in the first place, is late in maturing. There is some variation in the different varieties in the earliness of production, but, as a class, all of the sea-island cottons are late. In the boll-weevil area the late-maturing varieties of cotton have been driven out. They have not found it any longer possible to produce profitable crops with such varieties. There are no early sea-island varieties to which the planters can turn. That gives a very serious aspect to the situation.

Mr. HELGESEN. I notice in your notes here that you have the boll weevil of the sea-island districts of Florida and Georgia, and also a new form of boll weevil in Arizona. Is that new boll weevil one

Mr. HAZLEHURST. But after all summered down, the only way dealing with them is by the culture method?

Mr. HUNTER. The culture method; yes, sir.

Mr. HAWLEY. Have you given up hope of controlling the b weevil by the parasitic method?

Mr. HUNTER. Not altogether. It might be possible to introdu some parasite from Mexico. The weevil has existed for a long ti xico. We have very little hope for it, however. In fact, t note that we do not feel ourselves justified in spendi that line.

Mr. HELGESEN. This item carries $27,900 for the boll weevil. Do you pay for any investigational work out of any other appropriation except this one?

Mr. HUNTER. Not on the boll weevil. There is a great deal of work relating indirectly to the boll weevil done in the department, and there is an appropriation of something like $600,000 for demonstration work in sections infested with the boll weevil.

Mr. HELGESEN. But there is no direct work done under any other item except this?

Mr. HUNTER. This is the total amount the department utilizes in investigational work on the boll weevil.

Mr. CHAIRMAN. How much is that, did you say?

Mr. HELGESEN. $27,900. You will find it on page 325 of the Program of Work, at the bottom.

The CHAIRMAN. That includes all cotton insect investigations.

Mr. ANDERSON. It is about $16,000, according to my figures.

Mr. HELGESEN. I do not care how much it is. It is the only item to take care of the investigations on the boll weevil, he says.

The CHAIRMAN. That is true. Doctor, may I ask you what so many others ask me, what is the difference between the line of work that you are doing with reference to the boll weevil and the line of work being done by the States Relation Service at this time?

Mr. HUNTER. The demarcation is very distinct indeed. The Bureau of Entomology does the technical, investigational research work on the weevil; the States Relations Service takes the methods which have been revealed by the work of the Bureau of Entomology and applies them in the field by means of small demonstrations. In addition to making use of the results of the work of the Bureau of Entomology on the boll weevil, of course the demonstration service makes use of all knowledge that has been revealed by the work of the department and the State experiment stations along the line of improvement of cotton varieties.

The CHAIRMAN. Farm management and all those branches?

Mr. HUNTER. It is a perfectly clear differentiation between those lines of work.

The CHAIRMAN. You do not engage in any cultural methods on an extensive scale?

Mr. HUNTER. No, sir; only small plots, which are really in the nature of laboratory studies, as I have frequently remarked. Our field work is really laboratory work, investigational work extended into the field, where we can make exact tests.

The CHAIRMAN. Is there anything further on that item, Doctor?

Mr. HUNTER. No, sir.

Mr. HAUGEN. In your study of the grasshopper, the chinch bug, and the cotton-boll weevil, the result obtained is practically the same, is it not? You have no hopes of exterminating either?

Mr. HUNTER. None at all. The best thing we can do is to prevent a certain portion of the increase.

Mr. HAUGEN. The reason I asked the question is this: It seems to be the policy of the department to pursue the study of diseases and insects attacking certain crops, and, suddenly, some of them are set aside and some are pursued with greater vigor than others, as, for instance, the study of grasshoppers and chinch bugs and cutworms, which, I think, are more destructive than the cotton-boll weevil. A

very few thousand dollars is being expended on the study of grasshoppers, chinch bugs, and cutworms, while hundreds of thousands of dollars are being expended in the study of this cotton-boll weevil. Can you give any good reason why there is this discrimination?

Mr. HUNTER. The comparison is not altogether just, for the reason that the grasshoppers, cutworms, and other things you have mentioned have existed in this country for a great many years, and there is a certain amount of vested knowledge that we have about them. Certain things can be done, and a great deal is being done toward the controlling of these insects by the States Relations Service through their demonstration office, and a considerable portion of the money carried by that office is used indirectly in correcting these difficulties.

Mr. HAUGEN. The appropriation for the cotton-boll weevil comes largely under the States Relations Service, does it not?

Mr. HUNTER. It does. There is a specific appropriation for demonstration work under boll-weevil conditions in the South.

Mr. HAUGEN. You have the appropriation for the States Relations Service, and you have the special appropriation for the cotton-boll weevil. Of course I understand that a large portion of this money appropriated for the States Relations Service goes partly to demonstrations in the control of other insects and in the growing of crops, but the amount expended is small compared with the amount expended on the cotton-boll weevil.

Mr. HUNTER. Well, there is another very——

Mr. HAUGEN. Of course the corn crop is of greater importance than the cotton crop to this country—I mean in intrinsic value—and so is the wheat crop; and, if insects are so destructive to these crops, it seems to me that the department ought to give more consideration to the study of those crops. In looking through the items here I find that large appropriations are suggested for the study of diseases of the minor crops and very little given to the larger ones. For instance, for a number of years only about $5,000 or $10,000 was provided for the study of the sugar beet, and here we have been sending abroad $100,000,000 a year for sugar, an amount in excess of the total output of the gold and silver mines of our country. Only $5,000 is expended for the study of sugar, a very important crop indeed, and so on when you get to the more important crops, such as corn and wheat, we find that there is very little attention given to them.

Mr. HUNTER. That is a question that concerns the general policy of the department. I would prefer to ask Dr. Howard to answer that.

Mr. HAUGEN. I do not know who is responsible for it, but I wish to call it to the attention of the department, as you understand that this committee and Congress act largely upon the suggestions and recommendations made by the department. We pass upon the appropriations, that is true, but we first have the estimates and are largely governed by the estimates made by the department. Very seldom is an additional appropriation made except when supplementary estimates are made.

Dr. HOWARD. I get your general idea, sir. I think it is a very good idea; but, as I think Mr. Hunter was about to point out, the difference in this particular case is that the cotton-boll weevil is a new pest which is still spreading.

Mr. HAUGEN. It [illegible]t so very new.

Dr. HOWARD. It i[illegible] its appearance in Texas in 1893 or 1894.

Mr. HELGESEN. [illegible] men have appeared before this committee, and others, and they say they do have the complete knowledge that they can not eradicate it; can not eliminate it, or kill it off.

Mr. HAUGEN. You have reached the same conclusion as to the cotton-boll weevil, the chinch bug, and the grasshopper—that is, that none of these can be eradicated.

Dr. HOWARD. Yes; we have studied chinch bugs, grasshoppers, and the cutworms ever since they have been in this country, and yet we say we can not exterminate them. I do not believe we can exterminate any insect pest, except under very local conditions, but we can find out more or less about them the more we study them, and we have studied this thing for more than 20 years.

Mr. HAUGEN. Did I understand you to say it has now been reduced to the culture method?

Dr. HOWARD. Not entirely; not absolutely. There are still hopes of other methods besides the cultural methods.

Mr. HAUGEN. Is there nothing more to be done in the study of grasshoppers and chinch bugs?

Dr. HOWARD. We know a great deal more about them than we do about the boll weevil, but we have not abandoned the study of those insects. Small amounts are asked every year for the continuation of these studies.

Mr. REILLY. Doctor, are you learning something new about them every year?

Dr. HOWARD. Something, but not very much. There are new ideas about cheapening remedies that come up almost every year.

Mr. HAUGEN. What new ideas have you learned in the last five years?

Dr. HOWARD. About what?

Mr. HAUGEN. What is the result of your last five years' study?

Dr. HOWARD. Of what?

Mr. HAUGEN. In new remedies.

Dr. HOWARD. We found out a great many new remedies—a great many different methods of altering the crop methods.

Mr. HAUGEN. That is not the question. I think we were told that 10 years ago.

Dr. HOWARD. I can cite a concrete instance which was brought out by Congressman Barnhart in regard to a new pest which existed in the onion fields. He stated that by an appropriation of $5,000 the bureau had saved his district $1,000,000 a year.

Mr. HAUGEN. That was a good investment, and I am not criticizing or finding fault with the expenditure made on the cotton-boll weevil, but I think there might be some adjustment along lines that might be more equitable. More consideration should be given to the intrinsic value and importance of crops.

Dr. HOWARD. I could repeat many instances like that mentioned by Congressman Barnhart; in fact, I could talk all the afternoon along that line.

Mr. HAUGEN. I am not holding your bureau responsible but simply bringing this up to call it to the attention of the department, in order that the department may pay more attention to the more important crops, or else, if it is found advisable to abandon the study

[illegible]

The Chairman. [illegible]

Mr. Hunter. [illegible]

Mr. Vernon. [illegible]

Mr. Hunter. [illegible]

The Chairman. [illegible]

Mr. Vernon. [illegible]

Mr. Hunter

ng the present season. For years they have been using paris
n down there and they have been controlling the worms more or
but they have also been injuring the tobacco. There is a certain
nt of burning, and in many cases the remedy has been almost
ad as the evil. This new form of poison does not injure the
co in any way. On a single plantation in Florida and Georgia
e past season—the plantation of the American Tobacco Co.—the
cation of this method was made by the manager and saved him
00 on an acreage of 700 or 800 acres of tobacco in the one hold-
We believe that the method can be improved still further, and
casions when the worms are exceptionally injurious a property
that would eventually be able to double the saving that they
e from the present rather crude methods of application.
r. HOWELL. What does it cost per acre for this method?
r. HUNTER. About $1.10 per acre for the material. A laborer can
y this to about 3 acres a day, which would mean a total cost
ay, $1.40 an acre.
r. HOWELL. Do you say there is only a saving of from $2 to $4
re? What is the saving resulting in this spray to an acre of
co?
. HUNTER. It varies from $2 to $4 an acre, depending upon the
ity of the infestation.
. HOWELL. Then it costs just as much to apply the remedy as
ave in products?
. HUNTER. The highest estimate would not involve an expense
ore than $1.40 an acre. A saving of 60 cents per acre is rather
terial one; that is, in the net crop produced.
. ANDERSON. Your statement has reference to the saving in the
as between the Paris-green method and this arsenical method,
ot to the saving through increased production of the crop?
. HUNTER. It has reference to both. It was the additional sav-
y the use of this new method above what could be saved by the
f Paris green.
. ANDERSON. That certainly is not represented by $2 an acre?
. HUNTER. Those are the figures I have.
. ANDERSON. The additional saving of the crop?
. HUNTER. Yes, sir.
. ANDERSON. Amounts to $2 an acre?
. HUNTER. At least $2 an acre.
. ANDERSON. What is the difference in the cost of the two
ods?
. HUNTER. The cost of the material and labor are practically the
in the two methods, but the difference comes in in the burning
certain number of leaves by the Paris-green method.
. ANDERSON. But one is practically as effective as the other?
. HUNTER. Practically as effective in killing the worms, but the
ate method is practically harmless to the plants.
. LEE. How do you apply this—by one application of the stuff?
. HUNTER. Ordinarily one application is sufficient.
. ANDERSON. I would like to ask you what the character of
nstrations is that you make.
. HUNTER. They are experiments rather than demonstrations.
tually we believe that this work will resolve itself into a strictly
nstration operation, but at the present time there is some ques-

tion about the proper time to give the application with reference to the different stages of the tobacco. It is to obtain more information on those points that we are conducting these so-called demonstrations. Ordinarily they cover 4 or 5 acres of tobacco on a farm.

Mr. ANDERSON. In how many different localities?

Mr. HUNTER. In one general locality—the dark-tobacco region in Tennessee and Kentucky—perhaps half a dozen counties.

Mr. ANDERSON. How many dinfferent plats in the country?

Mr. HUNTER. That varies in the different counties. I think the largest number in any one county was something like 18. Our idea is to spread these experiments, or demonstrations, if you prefer, over a considerable area, so that each one will serve as a focus for local information.

The CHAIRMAN. Are you ready to go into this demonstration business this year in full force?

Mr. HUNTER. No, sir; we are not ready. We believe that, before the application is made a rule-of-thumb matter we should know more about the difficulties that the particular farmers will encounter in the operation and the effectiveness of the treatment under different conditions.

The CHAIRMAN. You mean to say that your work has not progressed beyond the investigational stage?

Mr. HUNTER. Exactly.

Dr. HOWARD. We are a research bureau, Mr. Chairman—not a demonstration bureau at all.

The CHAIRMAN. All right, Doctor, take up your next item.

Mr. HUNTER. I think that is all I have to say, unless there is something you would like to ask me.

The CHAIRMAN. Well, you probably want to tell us a little something about the cigarette beetle and this mosaic disease.

Mr. HUNTER. The rest of the work is more or less routine. The principles underlying it have been brought out by Dr. Howard in his remarks, and I doubt, Mr. Chairman, whether it is necessary to take the time of the committee to go into these any further.

The CHAIRMAN. Well, this sugar-cane moth borer—all of those are strictly investigational research problems?

Mr. HUNTER. Strictly research problems.

The CHAIRMAN. Which I presume you have been carrying on for some time and will likely wish to carry on for some time to come?

Mr. HUNTER. They are of rather recent origin. We believe we have made considerable progress, and that we would be justified in continuing that work on the present basis.

The CHAIRMAN. The note here is so very full as to the reasons for the increase that I think the members of the committee will count that as sufficient.

STATEMENT OF DR. A. D. HOPKINS, IN CHARGE OF FOREST AND SHADE-TREE INVESTIGATIONS, BUREAU OF ENTOMOLOGY.

The CHAIRMAN. Take up the next item in the Book of Estimates, No. 37, "for investigations of insects affecting forests."

Dr. HOWARD. Mr. Chairman, Dr. Hopkins, who has charge of that work and who has not appeared before the committee for several

years, is here, and, if you have time, I would like to have you hear from him.

Dr. HOPKINS. Mr. Chairman and gentlemen of the committee, this work is covered, so far as the projects are concerned, so well in the Program of Work that, unless you desire to ask some questions on any of these subjects, I think perhaps I can give a better review from memorandum I have prepared.

Our work on forest and shade-tree insects comes under three primary projects—supervision, field investigations, and laboratory investigations.

Supervision includes the general administration of the work provided for under the appropriation for forest insect investigations, with special attention given to the directing of investigations on the broader and fundamental problems and principles relating to the science and practice of forest entomology.

The investigations under special supplementary projects are assigned to field and laboratory specialists who devote their entire time to the solving of the problems presented and at the same time represent the authoritative source for all information relating to their special field of research. In this manner we hope to build up and establish a source of expert advice on all phases of the science of forest entomology and on the underlying principles essential to success in practical application.

The field investigations are conducted at present from six field stations designated and located as follows:

First. The northern Rocky Mountain station, Missoula, Mont., with field of activities including the States of Montana, Idaho, Wyoming, South Dakota, Nebraska, and the eastern half of Washington and Oregon.

Second. The southern Rocky Mountain station, Colorado Springs, Colo., for the States of Colorado, New Mexico, Arizona, Utah, and Nevada.

Third. The Pacific slope station, Placerville, Cal., for the State of California and the western parts of Oregon and Washington.

Fourth. The tree seed inspection station, Ashland, Oreg., for the investigation of insects affecting the seeds of western conifers.

Fifth. The eastern station, East Falls Church, Va., for the States east of those covered by the western stations.

Sixth. The Long Island station, Lynbrook, L. I., N. Y., for the investigations and demonstrations of control methods against the insects which are threatening the destruction of the hickory and oak forest and shade trees of the island.

The laboratory investigations relate to the more intensive scientific research, including the identification and description of the species of insects involved in the various lines of field investigations.

The general and special subjects under investigation are given in the Program of Work for 1916 under 20 economic and 9 technical subactivities.

The published results of the past year's work are included in 25 bulletins and special papers, aggregating 571 pages, 49 plates, and 217 figures.

Mr. HOWELL. Are those bulletins known as Farmers' Bulletins?

Dr. HOPKINS. I think some Farmers' Bulletins are included in these.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The successful practical application of this principle has been demonstrated in more than 20 demonstration and instruction areas established during the past 10 years under our instructions by the Forest Service, the Department of the Interior, and private owners of timber. This has involved the treatment of over 500,000 infested trees, representing over 4,000,000 board feet, on a total area of over 150,000 acres, at a cost to the Forest Service and private owners of about $75,000, the cost per tree ranging from nothing to $4, and in one case the treated timber, sold and converted into lumber, showed a balance to the credit of the owner of $1.12 per tree. In no case was more than 75 per cent of the infestation of the treated and adjacent untreated areas removed. In fact, it is estimated that the average percentage was not over 40, yet in every case where the control work was done in accordance with our recommendations marked reduction of the death of the timber followed, ranging from 75 per cent to 95 per cent below that of the year preceding the beginning of control work.

Since our investigational work is more or less distinct from that of other research branches of the Federal and State service, and our relation to the Forest Service and the public is that of the investigator and technical adviser, there is not much need for direct cooperation in its true or official sense. There has, however, been considerable coordination of effort between our branch of the bureau and the officials of the Forest Service, national parks, and Indian reservations with reference to demonstration control work, in which we have made the recommendations, given instructions, and conducted the investigations connected therewith, while the forest officials and owners have attended to the practical features of the work. Now that the principles and methods we advise have been fully and successfully demonstrated, there is less need for such direct assistance, in addition to the advice which is always available. Therefore, we are enabled to concentrate our activities along the lines of our primary duties in research work.

We are inaugurating this year a comprehensive movement on Long Island, an effort to establish a policy of community action on com-

munity problems, on the principle that the Federal and State service can help that community best which helps itself most. In other words, we are diagnosing a serious case of insect attack on the hickories and oaks and will give the prescriptions and general instructions on the practical details essential for success and then leave the community to make the practical application. So far it is working out all right; one community is already disposing of about 1,000 hickories and 1,000 oaks in the proper manner to control the depredating insects and a most gratifying interest is being manifested among the most influencial estate owners of the island.

This is a general review of the work in this branch.

Mr. OVERMYER. Doctor, could I ask a question? I have on my farm at home a large red-oak tree, and in the last few years I have noticed, when the leaves were falling, that on the underside of the leaves were a number of deposits about the size of a small pea, covered with something that looks like hair, and when cut open they have two chambers, and in each chamber there is a small white worm. Do you know what they are?

Dr. HOPKINS. It is a gall caused by an insect that deposits its egg in the tissue of the young leaf, and produces an irritation which changes the life activity of the leaf.

Mr. OVERMYER. Is there danger of it destroying the tree?

Dr. HOPKINS. They cause absolutely no injury to the vitality of the tree.

Mr. OVERMYER. I would like to ask Dr. Hopkins this question about his hickory-nut investigation: In the last few years we have not had any hickory nuts in northeast Ohio that were not wormy and bad. You have an item on page 332. What progress are you making in that line?

We had a very large number of nuts a year ago, but none of them were any good. I wondered if there was any way to reach this problem.

Dr. HOPKINS. No; I think there is no practical way of dealing with them except to destroy the nuts as they fall.

Mr. OVERMYER. But you want to get the hickory nuts.

Dr. HOPKINS. You will next year, perhaps. The problem affecting the trees is far more serious, because it is exterminating the trees.

The CHAIRMAN. Are there any further questions, gentlemen? We are much obliged to you, Dr. Hopkins.

STATEMENT OF DR. L. O. HOWARD, CHIEF OF THE BUREAU OF ENTOMOLOGY—Continued.

The CHAIRMAN. Dr. Howard, take up item No. 38, please, sir.

Dr. HOWARD. The next item is for investigations of insects affecting truck crops and stored products. Dr. Chittenden, who has charge of that work, is ill to-day, and asked me to make the presentation of the subject to the committee. I hold in my hand a statement regarding the investigation of truck-crop insects and also in regard to stored-product insects, as carried on under Dr. Chittenden's direction, which I would like to put into the record.

The CHAIRMAN. Without objection, that may be inserted in the record.

The following statement relates to the work of the Bureau of Entomology [illegible]

[illegible]

[illegible] the work of investigation of [illegible] has [illegible] a basis [illegible] for the establishment of [illegible] per cent of [illegible]. The [illegible] observed [illegible] conditions [illegible] upon [illegible] for the proper application of [illegible] work [illegible] the use of [illegible]. Possible control [illegible] by natural agencies is [illegible] studied, [illegible] the effects of [illegible] treatment [illegible] many [illegible] [illegible] [illegible]

ent summer. The time has as yet been too short to permit of an accurate mate of results obtained this year.

Cucurbit insects.—Work under this head is conducted in cooperation with the ginia Truck Experiment Station, and informal cooperation with other institions and growers is also undertaken. This project is one which requires definite time for completion, as new items are continually being brought forrd. The results accomplished during the past year will be difficult to estiate in amount of crops actually saved or in financial benefit accruing to the per and the public, as the work of last year has not yet been completed.

ork in the Rio Grande Valley on the melon aphis is particularly necessary it is being given due consideration. In former years a considerable acreage muskmelons was regularly planted in this valley, and it was demonstrated t these could be successfully and cheaply grown, producing melons of a h quality. Unfortunately the advent of the melon aphis rendered the ting and cultivation of this crop quite difficult and the results precarious. mpts are now being made on small acreages of melons now regularly ted in the valley to show the results of spraying with special machinery, ch will insure a regular crop despite the attacks of the melon aphis and stimulate the production of melons in this otherwise desirable locality.

he life history of a new species of squash bug has been worked out in isiana, and the best methods of control have been established.

Sugar-beet insects.—At the station Spreckels, Cal., the life history of the urly-top" leafhopper is being completed, and it has been conclusively shown t only sporadic outbreaks of this pest are to be expected. Work on the con- of the sugar-beet wireworms has been temporarily brought to a close after successful season, in which information furnished by this department has California alone benefited sugar-beet growers to an estimated value of 000,000, while the benefit due to the studies of the sugar-beet webworm, the gar-beet leaf beetle, and the control of grasshoppers in Colorado and Kansas e been even greater. A saving of $7,500,000 is estimated in Colorado and 200,000 in Kansas through the prevention of attack of grasshoppers to sugar ets and truck crops. Injury through defoliation of sugar beets causes both loss in the percentage of sugar carried and in the number of tons per acre, d even in the case of no reduction in the tonnage the amount of sugar present the beets may be reduced as much as 20 per cent.

General vegetable, truck, and garden insects.—This work has been of a inor character and, as such, is difficult to estimate. The saving in this conction is largely that experienced by individual growers who have received formation through correspondence with this branch of the bureau. Thousands letters have been answered in connection with this problem, which includes large number of less important vegetable and truck-crop insects, the loss om which, while individually small, aggregates an enormous sum annually. is project from its nature must necessarily be continuous.

STORED-PRODUCT INSECT.

This line of investigation is in many respects different from any other dertaken in the Department of Agriculture. A nearly complete life study is been made of all of the insects of this class, 60 to 80 in number. Work i these insects has extended over a long period of years. It is not always i easy problem to test remedies under proper conditions, but through advice ven in several publications issued by this branch of the service we seldom ar reports from certain insects which, at one time, were exceedingly deructive. One of these was a flour beetle which, during several seasons, was e dominant pest in some cereals and other vegetable food products. Afterards, the Mediterranean flour moth attracted much attention and grew to ch proportions that it was found necessary to bring all possible notes to-ther in the form of a bulletin of advice. Large editions of this have been blished and reprinted in trade and milling journals, with the result that w millions of dollars are saved by the knowledge of how to treat mills inted by this insect with the proper fumigants at the proper strength and ith the necessary precautions against danger to human life. These fumigants e poisonous to human beings, and one of them, bisulphid of carbon, is highly flammable unless the greatest care is observed in its use.

Many instances of insect injury to stored products have been reported. and quests made for investigation, but owing to our small appropriation ($5,000), e are not able to conduct more than a limited number of these each year,

for in cases where investigations by the experts [illegible] a report has been conducted it is usually possible to [illegible] asked. There remain many points to be settled, however, before [illegible] can be published.

During the year the so-called Argentine corn weevil, which [illegible] respects as not known was the subject of investigation [illegible] advisable to publish on this topic at the present time, [illegible] desirable to prejudice anyone in regard to the value of Argentine corn which received in this country.

A [illegible] which has been considered from [illegible] the [illegible] of the other sources of infestation of export [illegible] which [illegible] report, but it has been determined [illegible] principal [illegible] occur in the mills where the [illegible] there is probably to occur to any great extent on [illegible] heard of [illegible] vessels.

All new [illegible] which are submitted are being carefully [illegible] with [illegible]. The so-called pink corn worm, [illegible] of considerable importance in Mississippi and neighboring [illegible] Europe, has been investigated and the results are [illegible] for publication.

Work [illegible] as a preventive of injury to corn [illegible] of the construction of [illegible] mills has been concluded and [illegible] be made [illegible] temperatures, high and low, and the [illegible] of various kinds.

There is [illegible] for information in regard to the three principal insects [illegible] in the South, namely, the rice weevil, the [illegible] and the Angoumois grain moth, and considerable more study must be carried [illegible] before the product can be completed.

A new [illegible] of chocolate has been studied and results are available, and the [illegible] of various minor pests.

The [illegible] pests will require constant study, and, while we may publish on them from time to time, these projects may never be thoroughly ended because of the fact that we discover new and cheaper and more effective remedies from time to time. Fumigation with hydrocyanic acid gas from potassium cyanid has been superseded by the use of sodium cyanid because of the potassium salt being unavailable. Full information in regard to this has been published. There is [illegible] another of our best fumigants, bisulphid of carbon. Explosions [illegible] some of these is the subject of special study.

While much of this work is being done at field experiment stations of this branch of the bureau, at least 50 per cent is conducted in the Bureau of Entomology at Washington.

There has been great demand for information in regard to insects injurious to the seed of peas, beans, cowpeas, and other leguminous plants, and this has been met by correspondence. A publication covering the subject is under way.

Demand is also made for information in regard to insects injurious to animal products, the insects concerned being the cheese or ham skipper, the ham beetle, the larder beetle, and similar insects which affect the various forms of dried meats.

There are many minor problems also in the case of insect enemies of fabrics such as silks and such commodities as leather upon which information is sought.

Dr. HOWARD. I will be glad to answer any questions that may be asked concerning insects of this class, Mr. Chairman. These investigations in many instances have accomplished a great deal of good.

Mr. ANDERSON. I notice you have an item under this appropriation of Argentine corn weevil.

Dr. HOWARD. Yes, sir. A curious thing about the so-called Argentine corn weevil is that the grain people in Chicago found a number of weevils in the imported grain from Argentine, and a member of the House introduced an amendment two sessions ago appropriating a large [illegible] of money for an investigation. The chairman of the

e called me up on the telephone and asked me about this, d that, so far as we knew, what they called the Argentine vil was already in the country; that is to say, most of the vils are cosmopolitan and are carried by commerce to all the world. Still it would be well to conduct an investiga- ie conditions under which Argentine grain is shipped to this ınd to determine whether there is not some way of reducing tation.

NDERSON. Then it is not a recently imported worm?

)WARD. No, sir.

HAIRMAN. Doctor, we had a statement here the other day in to the instigation of this work in the study of the cucumber

)WARD. That would come under this heading.

HAIRMAN. I understand that there will probably be a sup- l estimate of about $5,000 for the instigation of that work.

OWARD. Yes, sir. Immediately after the chairman of the e the other day told me to get up such an amendment I did sent it to the Secretary of Agriculture, and I thought it ve probably been in your hands by this time.

HAIRMAN. It has not reached us yet. It has to come from the t, and he is absent at this time. You think this amount is y necessary to carry on this investigation?

)WARD. We can continue the investigation on these insects ct the cucumber under the present appropriation, but we rdly spare the services of more than one man under present ations for that investigation. If the sum of $5,000 in addi- lotted to this branch, two more experts could be employed d on that work of the best methods of destroying the insects e carrying these injurious diseases to the cucumber plant.

HAIRMAN. Do you have hope, Docor, that you can finally over these insects?

)WARD. I have very little doubt of it, sir.

HAIRMAN. It is a question of going after it very vigorously me?

)WARD. I should think so; yes, sir.

)WELL. Are the insects affecting the sugar beet on the in-

)WARD. The number of species seems to be on the increase ly, but the amount of damage to the crop does not seem to be g.

)WELL. The pests which affect the sugar-beet industry gen- er the country—are they different insects in different locali-

WARD. There are some different insects in different localities. r-beet webworm, for example, has a rather restricted dis- It is found in Utah and California, and the sugar-beet m is found in Utah and California, too.

)WELL. What pests do you have in Michigan and Wisconsin?

)WARD. Those are other pests—cutworms and other species ppers.

)WELL. Do the beet-sugar manufacturers cooperate with you ıdication of these pests?

[illegible]

Dr. HOWARD. [illegible]

Mr. HAUGEN. [

The CHAIRMAN. I will say to Mr. Haugen that I have had several members speak to me about this item, and I had some young man visit me, a Mr. Pellett, who wanted some demonstration carried on.

STATEMENT OF DR. E. F. PHILLIPS, IN CHARGE OF BEE-CULTURE INVESTIGATIONS, BUREAU OF ENTOMOLOGY.

The CHAIRMAN. Doctor, take up item 39, "for investigations in bee culture."

Dr. HOWARD. Mr. Chairman, will you allow me to introduce Dr. Phillips?

Dr. PHILLIPS. Mr. Chairman and gentlemen of the committee, the work which falls to my lot is somewhat different from any other that is carried on in the bureau, because, instead of endeavoring to destroy the insects in which we are interested, we are trying to propagate them.

The work on beekeeping, as set forth on page 346 of the project book, starts with a project on the wintering of bees. This project was begun in 1912 and has been continued since, and we expect it will occupy considerably more of our time. I may say in justification for this project that there is an enormous loss of bees every year—at least 10 per cent—owing to improper wintering. I may also say, in explaining this loss, that probably 800,000 people in the United States are interested to a certain extent in bee culture, but the vast majority of these people have but a few colonies of bees, and it is a mere side line with them. However, the number of people who are making bee culture their sole means of livelihood is increasing in a way which pleases us greatly. We feel that bee culture will become a staple agricultural industry only when it gets into the hands of people who are making that their main business. One reason for winter loss to the beekeeper is that a man is not inclined to devote much attention to the study of problems of a given line of work unless he has enough money invested in it and enough money coming from it to justify a certain amount of detailed study. That is especially true in the matter of this problem of wintering of bees. As I say, the annual average loss is at least 10 per cent, but there have been some striking examples of still greater loss. In 1903 and 1904, in the New England States, the beekeepers lost from 50 to 75 per cent of all their bees. In many of the Northern States the loss, to be exact, is 25 per cent one year in three. We feel, therefore, that we are quite justified in taking this up for very serious study.

One might suppose that bee keepers would find ways of protecting their bees from the cold, and therefore that it would not be necessary to carry on these extensive investigations, but when we undertook this problem we learned that the bee keepers did not know the fundamental things about this problem on which practice must be based. They did not know, for example, the conditions under which bees generate heat in response to cold without; they did not know the effect of the various foods on this generation of heat; they did not know the effect of confinement of the bees to the hive and its influence on the wintering of bees. Some of these questions we have been able to answer for them and many others still remain to be solved. So far our direct recommendations to the bee keepers have been only in the way of advice with regard to the wintering of bees

outdoors. Many bee keepers, in order to winter their bees, keep them in cellars. This method of wintering bees complicates it very decidedly from the standpoint of the environment factor influencing the behavior of the insect, and more study will be necessary.

We find that there is a critical temperature at which bees begin to generate heat. This critical temperature is 57° F. When the air immediately surrounding the bees drops to a point below this the bees begin to generate heat, and when they are kept at a temperature either higher or lower than 57° extra work is necessary on their part.

It is perhaps interesting to know that the bee, so far as we have been able to learn, is the only insect which goes through the winter practically making its own heat environment. Other insects usually hibernate and even the other social insects do under some circumstances. The bee is the only one which stores food and generates heat in response to lower outside temperatures. The problem, as I say, is one which seriously affects the bee keeper, causing a loss now of at least $2,000,000 annually to the thousands of people who are interested in this business.

The second project is the development of bees, which is conducted by Dr. Nelson, a member of the office. This is one of the projects which we have for the purpose of acquiring fundamental information concerning bees. We find that bee keepers know less about the animal with which they deal than do the owners of any other animal which we can call live stock. The bee really is not a domestic animal, in the strict sense of the word, but the bee keeper knows so little about them that we feel justified in accumulating information with regard to their structure, development, physiology, and behavior under various changes of environment.

The effect on bees of spraying fruit trees is carried on in conjunction with the bureau office investigating insects affecting deciduous fruit trees.

The next project is the diseases of bees. This is one of the first projects taken up by the Bureau of Entomology in beekeeping. There are three diseases of the brood of bees which are widespread in the United States, and we first of all undertook to find the causes of these diseases. The causes of all three of them have been determined by investigations of the Bureau of Entomology for the first time.

A very important problem was to learn where these diseases were located. We have gone over the United States getting information from the bee keepers, samples of diseased brood, and other kinds of information, and we now feel that we know practically all the counties in the country where the diseases are found. We find that there is some disease or other in about one-third of the counties in the United States, causing a loss to bee keepers of approximately $1,000,000 a year, as nearly as we can estimate it.

The control of these diseases does not lie with our bureau. In fact, we have no inspection service. When this work was begun, about 10 years ago, there were a few States which had some sort of foul brood inspection laws. At the present time there are 35 States and Territories which have some sort of regulation in this matter. Practically all of these States have men whose business it is to go from bee yard to another to give the bee keepers information

these subjects. We feel that perhaps we are entitled to a little edit in having stirred up this work and in having created wide-read interest in the various States in this matter. I need scarcely y we are very glad we do not have the inspection side of it our-lves, because that is a work that is somewhat unpleasant, but we e very glad to know that we have instigated others to take up is work.

The project on wax production has temporarily been discontinued.

Mr. HAUGEN. Have you discovered a remedy for these diseases?

Dr. PHILLIPS. We have, but I can not say that we have discov-ed that by ourselves. There were certain treatments which were ll known to bee keepers who were familiar with the literature on e subject, but we have improved on these methods; we have made em more economical to use. We are now able to give advice which, adopted, will keep these pests from doing any damage to the final ason's crop of the bee keeper.

Mr. HAUGEN. Was the loss due to the housing of bees?

Dr. PHILLIPS. It is due to the bacterial diseases which affected the ood of the bees.

The CHAIRMAN. Doctor, the suggestion has been made to me per-nally, and to other members of the committee, that your office uld conduct what we call demonstration service with reference to is bee work.

Dr. PHILLIPS. That would naturally come under the very next oject, Mr. Chairman, which is now classed as a research project—rvey in beekeeping. We asked permission of the Secretary of the partment to make a little test case on demonstration work, and the 1st of October we sent a man to the State of North Carolina see whether it was possible to help the bee keepers of that region develop better conditions along beekeeping lines. In his report he ates that he found a rather startling condition, in that at least 95 r cent of the bee keepers in that State are still keeping their bees in gums" or boxes and are not using modern hives and modern manip-ations. He found that prevalent throughout the State. He finds, nearly as we are able to estimate, that the present annual output r colony of bees throughout the State averages not more than 10 unds of honey per colony. He finds also that the bee keepers who e doing fairly good work are getting from 50 to 60 pounds per lony and are also reaching 90 and 100 pounds per colony in some asons. He did not find a single bee keeper in the State of North arolina who is using the very best methods throughout in his prac-ce. We feel justified in believing that, if we could enlighten the e keepers on the subject, it would add greatly to their income. Our ne man who did this work made the statement that he also felt rtain that, if this demonstration work could be carried on, it would ean at least $3,000,000 a year to the State's resources—possibly more an that.

Mr. HAWLEY. How does this machine-made honey compare to that ade by the bees? Is there any process by which artificial honey can made to take the place of bee-made honey?

Dr. PHILLIPS. There is no substitute for honey, so far, and we do t expect there ever will be.

(Thereupon, at 5.20 p. m., the committee took a recess until ednesday, February 2, at 10 o'clock a. m.)

[illegible]

[illegible] ASSISTANT CHIEF OF THE BUREAU OF ENTOMOLOGY.

[illegible]

[illegible]

[illegible]

with gas. Our experimental work with that treatment for Florida is completed. It is still used, however, in the demonstration and experimental work and is also turned over to the orchardists for their use.

During the last few years we have been working more particularly on control of insects which appear on citrus trees in Florida by the less expensive means of sprays. The gas treatment is particularly applicable to California, but we found that it did not apply equally well to Florida. The Florida citrus groves are less profitable, and there is uncertainty on account of frosts. The gas treatment is an expensive one, and the grove owners are not willing to use it on account of the expense and the uncertainty of their future crop. We have therefore been compelled to develop control by other means, and spray control in Florida has been developed into a practical system effective against the white fly, the rust mite, and scale insects, and this spraying treatment is being generally adopted.

The work of the last year and the work which we now have in progress is, in a sense, orchard demonstrations. Representative orchards are selected throughout the State and these orchards are treated under the supervision of our agent, at the expense of the orchardists, who furnish the materials, the machines, the horses, and the men.

These orchards are both experimental and demonstrational; that is, they demonstrate to us that we are on the right track and that our remedies are sound, and they demonstrate to the owner and to his neighbors the same thing. There are perhaps 18 or 20 of these orchards in different parts of the State, all under the supervision of one man and an assistant machinist, who is an expert in spraying apparatus. These two men are doing this work in Florida at a comparatively small cost; and it is a very useful work and one that is highly appreciated by the people of that State.

I may say for Florida that we have in prospect a further study of the parasites of the white fly. A number of years ago we made an expedition in search of parasites, and the result of this search was the discovery of the native home of the white fly in India—not known before. The supposition had been that the white fly may have come from China or Japan, but it was found by our agent to be a native of India and that in central India there were various predaceous and parasitic enemies that are there a large element of control. These Indian parasites and enemies were new to us and new to the world, for that matter, and an effort was made to introduce them into Florida. They were brought over successfully, but the various vicissitudes of the first winter wiped them out, and we have not had an opportunity to repeat the importation. When the world becomes pacified and oceanic navigation becomes safe we hope to make another attempt to introduce these parasites.

The station for the investigation of citrus and subtropical insects in the Gulf region has been located at New Orleans for two years. New Orleans is a great port of entry for the products of Central America, the West Indies, and South American countries, and has been an entry point for a number of dangerous pests. This investigation at New Orleans was instituted from the realization that this was a danger poirt and not because the citrus industry there was

especially important. We wanted to know what was happening in that region, and an expert was therefore placed at New Orleans to study the insect conditions, and particularly the possible introduction of new pests, and to help the citrus industry directly by determining means of control of any pests that had a foothold. This region is infected—the whole Gulf region is infected—by the white fly. The chief damage in this region, however, is by scale insects and latterly by the Argentina ant—one of the insects referred to that was made its entrance at that port. This investigation has now been going on for something over two years and would normally have been brought to a conclusion probably at the end of this fiscal year. In point of fact, however, it is concluded now, or will be within the month. Its conclusion was hastened somewhat by a hurricane which came through that region a short time ago—last fall—and blew practically all of the citrus industry out of existence—the fruit and the trees. [Laughter.] It incidentally nearly blew our agent into the river.

Mr. HAUGEN. It did not blow the citrus canker out of existence, did it?

Mr. MARLATT. I am afraid not. It may have distributed it. It would perhaps have been a good thing for the Gulf region if that storm had made an absolute finish of every citrus tree in the Gulf district. It would be cheaper for the Government in the end if the Government is to undertake to eliminate the canker. This investigation was, however, substantially completed, so that it will be possible to make a useful report. When conditions make it necessary we shall be glad to take up this work again, either at New Orleans or at some other point in the Gulf region where the work will be most useful.

The work in California started a good many years ago in relation to the treatment of citrus trees with gas. This treatment is a method which originated with the Department of Agriculture—with an agent of this department in California some 35 years ago. Mr. Coquillett, who was then in the employ of the Bureau of Entomology, devised the method of covering trees with tents and liberating a very poisonous gas in these tents and thus killing the insects. It was brought to a state of fair development at that time, or within a few years, and has since been the chief means of protecting the fruits of the citrus orchards in California. Some years ago the citrus interests of California became very desirous of having the methods of gas fumigation standardized and placed upon an accurate scientific basis. And as a result of the appropriations which your committee has given for this work, this investigation has been brought to a satisfactory conclusion. A thoroughgoing study of the gassing treatment of trees has been made which has changed the whole method. The general principle remains the same, but accuracy and economy have been vastly increased.

The method of determining dosage and of generating the gas have been much improved, and the materials used in the production of the gas have been investigated and put on an exact basis, in cooperation with the manufacturers, so that adulterated and inferior material is no longer sold and the orchardists are protected in that way. There has been a vast improvement in insect control throughout that district by reason of these investigations.

In connection with that investigation we have studied the other sect problems in relation to citrus cultures of California. The in- stigation with gas is finished. When I say finished, I do not mean give the idea that we think we have really finished it. It is finished the sense that it is no longer a special subject of investigation. e hope never to finish it; we hope that our successors will be work- g on that gas problem and improving it 50 years from now. The oment work is stopped on a problem progress stops. In a minor ay we are still experimenting with the gas treatment and doing mething every year; and every new idea and every improvement hich is suggested from time to time is taken advantage of and sted out. In that sense, it is not finished.

Mr. HELGESEN. Do you mean to say there is nothing that can be ished; that when you start a thing you must go on forever?

Mr. MARLATT. Nothing has been finished since the world began. you know of anything?

Mr. HELGESEN. You know that gold has never been improved upon science?

Mr. MARLATT. But we find better means of getting it out of the rth. I think nothing has been finished.

Mr. HELGESEN. If you are ready to give out certain advice, after u have demonstrated that a thing is effective, I think you ought have finished it.

Mr. MARLATT. That has not happened; we have never succeeded reaching a point where further improvements are not possible. ot a single pest has been eliminated from the world's list of pests, d no human disease has been eliminated from the world's list of seases, and we have been working on diseases ever since history gan, and probably will always be working on the same old diseases. he greatest advance in medicine has been within the last 10 or 15 ars, and if we had stopped 15 years ago the world would have been sad loser now.

In that sense no work is finished. And I hope this committee alizes that the work which we are doing, when we take up a new bject and follow it through to so-called completion, is merely the ttainment of the immediately useful results, and that any such roject should be carried along and taken up again whenever the pportunity for improvement comes.

The CHAIRMAN. I am glad to have you make that statement. I ometimes wake up in the morning feeling extremely pessimistic bout the Department of Agriculture, and hoping that something ay be finished, so that we won't have to go ahead appropriating oney.

Mr. HELGESEN. You do have to worry about that, Mr. Chairman; at is my least worry.

Mr. MARLATT. I have enumerated some of the tropical-insect proj- cts which we say are finished, and I say that with the qualification have mentioned. We are not now spending large sums of money n them, and our reports have been issued. But we are still keeping at work in the back of our heads, to be taken up again whenever ecessary. The gas treatment in California is finished in that sense; it we are still working on some side problems. For example, a uestion that is unfinished in citrus-fruit investigations is what is

The other subtropical fruits are unimportant; at portant from the cause of insect injury. For instance, t is a considerable crop in Florida; but, fortunately, the almost immune from insect damage. The olive, whi important crop in California, fortunately, is also almo insect damage. We are hoping to prevent the great oli Old World, the olive fruit fly, from gaining entrance int States. If this insect can be kept out of the United St industry here will have a tremendous advantage over the try of the Old World.

Mr. HAWLEY. Do the date palms have any insect pests

Mr. MARLATT. Yes; unfortunately, the date palms ha troublesome scale insects, which the date users and the d in cooperation with the Federal Horticultural Board of ment and the Bureau of Entomology, are making a ma and heroic attempt to exterminate. These insects wer with date suckers, and with this form of introduction can not be excluded. I think if our date friends had they were doing in advance, they would never have suckers to America; but they would have introduced t taken their chance on seedlings. I said the date users were making an heroic effort to exterminate these pests. is this: They take infested date plants as high as thi coming up, as you know, with a perfect mass of leave down to the stem and peel the stems to the quick. The different from other deciduous fruits in that you can quick without killing the plant. The growing part is instead of on the outside, and, just so you leave enough to grow again, you can cut all the rest away. All th cut away, and then with a torch the surface is burned All the date orchards have been gone over in that way in and every tree that is found infested has been given thi At the end of two or three years trees so treated are ju

growers are enthusiastic as to the outcome of this method of control and feel that ultimately they will be able to catch the last scale. In these large orchards containing thousands of trees we can find now only half a dozen infested trees where they were practically all infested at the beginning. It looks encouraging.

The CHAIRMAN. Is there anything further on that, Mr. Marlatt?

Mr. MARLATT. That is all on the subject of citrus insects in the United States.

I understand that in your Book of Estimates here the next subject is the Mediterranean fruit fly, which is a closely related project.

The CHAIRMAN. Do you handle that project?

Mr. MARLATT. Yes.

The CHAIRMAN. Take up item 41, "For investigations and control, in cooperation with the Federal Horticultural Board, of the Mediterranean and other fruit flies, $33,200."

Mr. MARLATT. The worst enemies of fruit in the world are fruit flies; that is, flies which lay their eggs in the fruit just like the meat fly will lay eggs on meat and produce a horde of maggots. The Mediterranean fruit fly is probably the worst of these fruit flies. There are a dozen or 20 of them known to be injurious and, I suppose, a hundred or more species, or even more than that, in existence. The Mediterranean fruit fly is of the greatest importance on this account. It occurs now practically in every tropical region of the world except subtropical United States. It is not limited to the tropics; it can develop pretty well north and cover the orange district, or get pretty well into the peach district, and would probably attack all of our southern melon and peach crops. It attacks melons, tomatoes, and beans, and all fruits and even a great many nuts. It attacks berries, such as the coffee berry.

This insect a few years ago—about 1910, I suppose, or thereabouts—gained entrance into the Hawaiian Islands. The tropical conditions there and the universality of fruit, both wild and cultivated, made Hawaii an ideal haven for that insect, and it is now practically all over the islands. It was first noticed on the Island of Oahu, and after it was discovered there California, particularly, became very much excited, and the result was this appropriation by Congress to control this pest in Hawaii and prevent its entry to the mainland.

Mr. WILSON. Was not that prior to 1910?

Mr. MARLATT. The appropriation was made in 1912, and my recollection is, without looking it up, that it was known in the islands two or three years before that. They do not know exactly when it came.

Mr. WILSON. I was over there in 1909, and they were very much worried about it at that time.

Mr. MARLATT. It may have been there then. There was another fruit fly there at that time of which I have illustrations here, which is known as the melon fruit fly.

Mr. WILSON. Their coffee industry at that time was very seriously affected. Some of the coffee plantations which I saw were affected, and at that time they were complaining about the situation.

Mr. MARLATT. In 1909?

Mr. WILSON. Yes.

Mr. MARLATT. You are possibly right. They do not know the exact time of its introduction, and my statement was offhand. The

[illegible] there for a few [illegible] years. I presume, be- [illegible] of illustrations showing [illegible] fly—which we are [illegible] way it affects [illegible] exhibiting [illegible] the same as [illegible] does not indicate the con- [illegible] is pretty well advanced. You [illegible] perfectly sound citrus fruit or [illegible] peaches, and plums? [illegible] probably would at- [illegible] into the important [illegible] answer officially whether [illegible] the apple and pear or not. Un- [illegible] would be attacked, if they [illegible] limit—a cold limit?

[illegible] stand a good deal of cold. We [illegible] on the Island of Hawaii [illegible] and have carried the larvæ [illegible] there without any difficulty. I [illegible] indicating at least that the [illegible] our southern fruit districts. I [illegible] apple districts of the North, because they [illegible]

[illegible] a special appropriation of [illegible]. We established a station at Honolulu for [illegible] for the purpose of determining any [illegible] and for practical experimental [illegible] gave us authority under the plant-quaran- [illegible] investigation of the movement of fruit from Hawaii to the United States. That work has been going on ever since. Naturally the regulation of the fruit itself under quarantine regulation issued by the Department of Agriculture and the Federal Horticultural Board must go on indefinitely. That is continuing work. The investigational part of the work is substantially completed, and several papers have already been published on the subject—papers which deal with special phases of the study.

Mr. HUDDLESTON. I thought you said nothing was ever completed!

Mr. MARLATT. I qualify all my "completed" statements by my remarks made earlier in the morning that nothing is ever completed, and I hope, in the interest of human progress, never will be completed. We have published some interesting papers, for instance, upon the spe[illegible]udy of the banana, in connection with our investigation of the [illegible] fruit fly. The banana and pineapple are both im- [illegible] from the Hawaiian Islands. There was a question

e Mediterranean fruit fly would breed in these fruits. It
reported as secured from bananas in other parts of the
the records seemed to indicate that bananas when pretty
d or even rotten, so that the fruit fly could get into them,
e as host fruit. There was, however, in Hawaii a general
the banana was immune and that belief was especially
he part of brokers who had bananas to ship.
made a very thorough-going investigation of that subject
ree years and the results are now finished and in print.
that banana exports can be safely continued. The fruit
ttacks a banana under normal conditions and can only be
ler artificial conditions, to breed in the banana when it is
ith the fruit and the fruit is overripe or the skin broken.
the fly can not breed unless the banana is overripe or the
n is simply this, that the banana peel, and especially so
n, exudes, as we all know, a whitish liquor, and the mo-
y inserts its ovipositor into the skin of the banana to lay
is liquor smothers or destroys the eggs which the insect
ne banana. And, inasmuch as all bananas offered for ex-
een, there seems to be no danger with this fruit whatso-
thermore, every banana bunch which is shipped from the
Islands is inspected and bears the stamp of the Department
ture on the stem. Every banana bunch is gone over by
and every scratched or bruised fruit is cut out, and the
ven washed, if necessary, and the inspector then stamps
a steel stamp which cuts into the rind and leaves the mark.
e bananas reach San Francisco they are reexamined by the
ctor, who is working in cooperation with us. Under these
we believe the banana export from the Hawaiian Islands
safe and we are permitting it to go forward.

ase of the pineapple the conditions are even better. The
as never been shown to breed in the pineapple, except in
d rotting fruits, and even then the records are doubtful.

LAUGHLIN. You are speaking about this same European

LATT. This is the same European fruit fly. Our thorough-
riments have shown that the pineapple is not a host fruit.
apple industry the pineapples are shipped quite fresh, and
ll gone over and examined before packing to see that they
nd sound.

SON. Did you say the pineapple is not a wholesome fruit?

LATT. No; it is not a host fruit—that is, not a fruit in
nsects can live. These pineapples, as I say, are examined
l for shipment, and they are again reexamined at the port
ncisco; and the State authorities of California, who are
sted, are, as I understand, thoroughly satisfied with the
tures of both the banana and pineapple shipments.

IRMAN. In that regard, then, you can say to the commit-
a are getting the European fly under good control?

LATT. As far as shipments of bananas and pineapples are
I have not taken up the work that has been done on
locally to control it. If any of you have been to the
Islands, you can realize the absolute impossibility of con-
e insect generally all over those islands, which abound

...ath from. The fruit we are ... And you would have to put ... up every plant on those ... What they hope for, therefore, ... make it possible for them to ... the mango, peaches, etc. Control ... by poison and poison bait ... the fruit are not very practicable. ... readily in countries where fruits are ... and but in Hawaii whatever one man ... of his neighbor and is offset by the ... islands.

The main hope which the Hawaiian people ... parasitic control. They have had wonderful ... the islands in parasitic control of the sugar-cane ... of other plants and they are enthusiastic on this ... As they put it before our Government made its ... they had started a world-wide search for some parasite of the fruit fly, and they asked us to be allowed to continue that work at their own cost. They had started it and they wanted the credit for it. That search for parasites has been made very thoroughly by the Department of Agriculture of Hawaii. Their good luck has stayed with them and there was found, on the west coast of Africa, a number of parasites of the fruit fly. Their expert sent some of these parasites over; several of them reached the island in good condition, and one of them has already made a wonderful record. Within a year after the introduction of the parasite it had multiplied so that it could be distributed over two or three islands. Our agents are cooperating with the Territorial department of agriculture in the distribution work and the local establishment of the parasite. Within a year they have found 30, 40, and even 75 and 80 per cent parasitism in different parts of the islands.

Mr. McLAUGHLIN. What do you mean by that?

Mr. MARLATT. In other words, 80 larvæ out of 100 would be parasitized.

Dr. HOWARD. Killed?

Mr. MARLATT. Killed by this fly. That was particularly true of the coffee district of the island of Hawaii, in what is known as the Kona coffee district, where the coffee is grown over a large area and where the best opportunities, therefore, are present for the spread and multiplication of the parasite. The islanders are very hopeful, therefore, of some control by this and other parasites; and they have sent off one or two other expeditions for other parasites and may get some additional aid; but the one particularly mentioned seems an efficient one and one which gives most promise for the future.

Mr. McLAUGHLIN. Those parasites do not seem to have any business when they get over there except to prey on the European fruit fly, do they? Or do some of them become harmful themselves and set up in business on their own account after they arrive?

Mr. MARLATT. These parasites would only attack some larvæ similar to the fruit maggot. They do not attack caterpillars like the silk ... larvæ, and they are absolutely harmless to plants.

ıe CHAIRMAN. Is there any thing further on this subject?
r. MARLATT. I think that covers the subject; except I wish to say this appropriation is expended in cooperation with the Federal ticultural Board. A large portion of the work that is done is regulation and control of the movement of these crops that are ed out—bananas and pineapples. The Federal Horticultural d has no appropriation for that subject, but inasmuch as this y was for the control of the fruit fly, part of that control has the regulation of fruit movement under the direction of the ral Horticultural Board and the rest the control and research by the Bureau of Entomology. In the present wording the uage has been changed to bring that fact out—that the appropri- will be spent in cooperation with the Federal Horticultural d.
ıe CHAIRMAN. I notice in your note you say to investigate cer- other fruit flies, for instance, the melon fly of Hawaii and the ge fruit fly in Mexico, and you change the language there to le you to extend your investigations to other fruit flies and insects of that type.
r. MARLATT. Yes. It is a very large subject, Mr. Chairman. I ot want to take up your time, but the European fruit fly is ly a type. It is the worst of a lot of others, any of which may to America in time. There are a number of fruit flies in the Pacific islands that get in every now and then at San Fran- ; there is this fly that causes large damage to the fruits of ico, which we have quarantined against; and there are certain flies which occur on the West India Islands which we do not . This appropriation is large enough to cover all of these in- , and it was thought advisable to state definitely in the appro- ion the work to be covered.
r. OVERMYER. The existence of pests and insects is no doubt an ıded part of the scheme of creation. The battle between man insect always has existed and always will exist. I have seen the ts of some statisticians who undertook to explain how soon the d would be denuded of vegetation and everything else if man d cease all efforts of resistance to their attacks.
r. MARLATT. I think the world will last a long while, but I am nistic enough to believe that by our efforts we can help a lot in special cultivations.
r. OVERMYER. I say it is going to be a continuous battle, and ys has existed since the world began.
r. MARLATT. I think so.
At this point the Hon. John E. Raker, a Representative in Con- s from California, addressed the committee relative to the rabies ıtion among coyotes. His remarks will be found in the hearings r the Bureau of Biological Survey.)

TEMENT OF DR. L. O. HOWARD, CHIEF OF THE BUREAU OF ENTOMOLOGY—Continued.

ıe CHAIRMAN. Now, Doctor, take up item 42, "For investiga- , identification, and systematic classification of miscellaneous cts, including the study of insects affecting the health of man

[redacted]

[redacted] Mr. McLaughlin. Is Hawaii the only place where the pest is found?

Dr. Howard. No, sir. It just happens that it is the nearest and most available place. They have it very badly in Egypt and India and in other cotton-growing regions of the world. The potential harm from this insect is equal to that of the cotton-boll weevil.

Mr. McLaughlin. Is there danger of importing it with the cotton seed?

Dr. Howard. There is great danger of importing it with the Egyptian cotton, and for that reason the Federal Horticultural Board has [redacted] regulations governing the importation of Egyptian cotton. [redacted] decree was that Egyptian cotton coming in shall

e fumigated. The importing firms at Boston have erected fumigating rooms, and to-day every bale of cotton is fumigated with hydrocyanic-acid gas.

Mr. McLAUGHLIN. Is it reasonably possible to fumigate a bale so ghtly packed?

Dr. HOWARD. They have discovered that it is possible. They insert a perforated tube, pressing it in, and force the gas through that; d a careful examination has shown that the gas does not injure e fiber of the cotton, but does kill the boll worm. Also by an genious vacuum apparatus they kill the worms.

They have recently discovered a new danger in the importation of aste cotton from Egypt which has not been thought of until the last w days, and they have made a regulation absolutely prohibiting importation of waste cotton from Egypt.

Mr. WILSON. What do you mean by waste cotton?

Dr. HOWARD. Cotton that is eliminated in the process of manufacture. The waste from Egyptian long-staple cotton was discovered be of some use in this country and they had been sending it over, nd it was discovered by one of the inspectors of the Federal Horticultural Board in Boston within a few weeks.

The expenditure for this class of work is perfectly justifiable and s really one of the important branches of the work, although apparntly it only indirectly affects our work. For example, suppose we ant to import a parasite. If we know exactly what that parasite is rom the point of view of classification, then we know by analogy omething of its life history and of the possibility for good when nce imported, and that knowledge we can get only from the employment of these expert men who are thoroughly informed about all hese particulars.

The next item which we carry on under this appropriation No. 42 is the investigation of insects affecting the health of man and animals, and under the project arrangement here we have "eradication of the spotted-fever tick in Montana." If the committee wishes to hear some late news about the spotted-fever tick in Montana, I will ask Mr. Hunter to discuss that matter briefly.

The CHAIRMAN. Let us hear from you briefly on that, Mr. Hunter.

STATEMENT OF MR. W. D. HUNTER, BUREAU OF ENTOMOLOGY, RELATIVE TO THE SPOTTED-FEVER TICK.

Mr. HUNTER. Mr. Chairman, a new feature of the spotted-fever situation of Montana is that the virulent phase of the disease shows strong indications of spreading outside of the restricted valley to which it has been confined up to vary recently. A peculiarity of spotted fever is that it exists in two phases. Throughout the greater part of Montana, Idaho, Utah, Oregon, and Washington, the phase of the disease which is found shows a very low death rate—only 6 or 7 per cent—but in the Bitter Root Valley in Montana it is a much more virulent disease, the mortality being practically 100 per cent. In fact, we are told by physicians that this phase of spotted fever shows as high a death rate as any disease which is known, with the sole exception of rabies.

During the present season a number of cases of this virulent form of the disease were found about 400 miles away from the Bitter Root

[illegible]

Mr. LEE. Is that dipping process similar to the process used for the southern cattle tick?

Mr. HUNTER. It is very similar.

Mr. ANDERSON. What is the relation between the Montana tick and the Texas tick?

Mr. HUNTER. They are utterly a different species, quite as distinct as the sheep is from the cow.

Mr. HOWELL. The tick found in the Bitter Root Valley of Montana is the same as the tick found in Utah and Idaho?

Mr. HUNTER. Yes, sir.

Mr. HELGESEN. Just for the record? You have not stated whether or not this tick affects man.

Mr. HUNTER. It is the tick causing spotted fever of man.

Mr. HELGESEN. I understand, but you had not mentioned that, and I think it is necessary that it should go into the record.

Mr. HUNTER. I assumed, as this was a discussion of insects affecting man, that that was understood.

The CHAIRMAN. It is very fatal to man, as a matter of fact

Mr. HUNTER. Practically a 100-per cent death rate.

Mr. MCLAUGHLIN. How does it reach man.

Mr. HUNTER. By the bits of the tick. The tick acquires the virus of the disease from the various wild rodents. Later, in another stage, this tick attacks man and transmit the virus that was acquired from the rodent source.

Mr. HOWELL. That is similar to the manner in which the bubonic plague is transmitted, it is not?

Mr. HUNTER. They are exactly analogous. In the case of the bubonic plague, of course, the eradicative measures consist of an attack against fleas. The virus is carried by the rodents exactly as in the case of spotted fever, in which case the tick is the agent which transthe virus.

Mr. HOWELL. Do you think that all the other ticks in those States that you have enumerated are affected by this virus?

Mr. HUNTER. No; they are not all affected. The virus does not exist except in restricted regions, but from experiments conducted some years ago in the University of Chicago it is known that species of ticks which occur throughout the country are capable of transmitting the virus.

Mr. HAWLEY. But if they ever become infected they will spread the disease.

Mr. HUNTER. It necessarily depends on that.

Mr. HELGESEN. Is it not true that there are two species of ticks in the Bitter Root Valley, one on one side of the valley and another on the other?

Mr. HUNTER. Practically so.

Mr. MCLAUGHLIN. How long has the tick been known? How long has it been troublesome, and what progress are you making? You have discussed that to some extent, but just a word more.

Mr. HUNTER. The connection between spotted fever and the tick was worked out by Dr. Ricketts, of the University of Chicago, about 10 years ago. The work of the department in Montana was begun about 5 years ago, but our operations have not proceeded far enough to indicate how soon practical control will be reached; but during the last two years the number of cases in the Bitter Root Valley has decreased.

Mr. HOWELL. Do these ticks communicate infection to each other, or do they only get it from biting the animal?

Mr. HUNTER. They acquire it only through contact with the rodent.

STATEMENT OF MR. D. L. VAN DINE, BUREAU OF ENTOMOLOGY, RELATIVE TO MALARIA.

The CHAIRMAN. Take up the next item, Doctor, "Relation of malaria mosquitoes to agriculture in the South."

Dr. HOWARD. I would like to have Mr. Van Dine address the committee for a few minutes on this subject.

Mr. VAN DINE. Mr. Chairman and members, malaria is essentially a rural disease and therefore affects the farming class more than any other class of people. It concerns, therefore, all who are interested in the welfare of agriculture. The rural nature of malaria is explained by the biology of the species of mosquitoes that convey the disease. Their origin is the ponds or pools of water, canals and ditches, which are choked with vegetation, and the shallow margins of swamps, lakes, and marshes, and this surface water is found in the rural communities and not in the urban districts.

Mr. HAUGEN. Is the city of Washington considered a rural community?

Mr. VAN DINE. No, sir. I should modify what I said about the rural origin of malaria with the statement that in those cases where malaria is not of rural origin the towns or cities or their environs supply the conditions for breeding which I have mentioned. The rural nature of malaria is in contrast to yellow fever, for example, which is a disease of the cities, and the explanation there is also biological. The origin of the yellow-fever mosquito is the water in

Mr. M[illegible]. You speak of the loss of labor. Are the [illegible] by the attacks of the mosquitoes?

Mr. Van Dine. Not by the organisms responsible for human malaria. The parasites responsible for the disease which are car by the mosquitoes common to humans. Malaria is a diseas humans.

Mr. McLaughlin. But these same mosquitoes that attack hu beings will attack also the animals, will they not?

Mr. Van Dine. Yes, sir. But there are losses to agriculture f mosquitoes other than the loss through malaria.

Mr. McLaughlin. When they do attack the lower animals, w is the effect?

Mr. Van Dine. So far as we know now, as the records disc the effect is one of irritation and annoyance. In a dairy herd, example, badly bothered by mosquitoes, the milk production w be greatly reduced.

Mr. McLaughlin. Only by irrigation?

Mr. Van Dine. Yes, sir.

Mr. McLaughlin. Not by disease, as in the case with man?

Mr. Van Dine. No, sir.

The Chairman. In other words, the bite of the mosquito might cause malaria in man would not give it to hogs and creat of that kind? That is what you are getting at, Mr. McLaughlin

Mr. Van Dine. These malaria parasites are peculiar to man.

The first object of our work was to determine these losses. this purpose a typical plantation in the Delta region of the S was selected for an intensive study of the problem. Since the lo the planter occurs mostly through the labor, and since the prevai ty[illegible]abor on the plantations in the South is the tenant negro

ertook the study of malaria and its effect upon the time and t of the negro tenants first. The results of this study show that disease is more prevalent during the crop season, and that the nts suffer a great loss of time and their efficiency is greatly re- ed right at the time of the year when their labor is most needed plant, to work, and to harvest the crop. In many sections of the th, where cotton production is the main crop, it was found that laria added greatly to the loss by the boll weevil. Under normal ditions of cotton culture, before the advent of the weevil, the loss time in the labor would not be so serious after the crop is laid by. t under boll-weevil conditions it became necessary not only to in- duce other crops, to diversify, but also to pay more attention to cotton crop itself. More continuous work was necessary to com- the weevil. And the greater the demand on the labor, the more ious became the loss of time from malaria in the labor.

The result of this study showed that on this plantation there were tenant famalies. I will just summarize the results. Throughout crop season, from May to November, there was a total loss of e of over 1,000 days of adult time of the members of the 74 tenant ilies there. We have detailed figures supporting all of these rds, and this is the form for the records we used in that survey et at the details. It would be difficult to measure, in dollars and ts, just what the loss of 1,000 days during the crop season on one te meant to a cotton grower under boll-weevil conditions. But plantation manager went over my figures with me very carefully said that a very conservative statement would give a loss to self of $4,000, and to the tenants of $1,000.

The CHAIRMAN. Your figures absolutely confirm my own judg- it about it. I just figured it out here myself—$5,000. I regard time of a man on the farm in the South as worth $5 a day dur- the growing season of the cotton crop. Is that what you figure?

Mr. VAN DINE. Yes, sir; it comes out about that way. In other rds, under the tenant system of farming, the plantation owner and nager suffer the greatest loss from loss of time. Under the day ge, we have not figured that out definitely yet, but we have figures ch indicate that under the system of day wage the loss is more nly divided between the plantation owner and the laborer.

Mr. ANDERSON. What is the ordinary wage paid in the cotton sec- ns during the cotton season?

Mr. VAN DINE. Adult time should be figured on the basis of about a day. In figuring this loss, we figured all males over 18 years as lts, and females at half time; from 12 to 18 at one-half; from 12 at one-quarter, taking no account of the loss of time of chil- n under 8 years of age. But you can realize that when a child is with malaria and the mother or other members of the family ain out of the field to care for the child, there is a still further . We did not figure that.

The CHAIRMAN. The wage, Mr. Anderson, in my section, is $1 a and two meals—dinner and supper.

Mr. ANDERSON. I was somewhat interested in how you figured the basis of loss at $5 a day on the basis of payment of a dollar ay.

Mr. VAN DINE. The loss to the laborer, if he was on the day wage, uld be a dollar plus expenses of medical attention. But the neg-

[illegible]

Mr. [illegible]. Dr. [illegible]'s study so far has dealt with just this one phase of the [illegible] study, to get fundamental and accurate facts on the problem; and then we want to make comparative studies in other regions for just that purpose.

Mr. [illegible]. How many people were under observation in this experiment?

Mr. [illegible]. Dr. [illegible]. Two hundred and ninety-nine individuals in the different families.

Mr. [illegible]. How large a proportion of those people were married?

Van Dine. Forty-eight families out of the 74; 138 persons 299. And I would like to say that we consider the family as t, for the reason that under the tenant system of labor the is the unit. We had to study them as individuals and then p them by families to get the number of hours of adult time, forth, and the loss of time by families, as they are carried on ks of the company as tenant families.

Anderson. It is possible, is it not, to make an absolute diag- a malarial condition?

Van Dine. Yes, sir; and all our cases that were included in r at our results were supported by a microscopic examination lood of the patients.

Chairman. These darkies who live in the malarial sections outh—do they become immune to malaria?

Van Dine. I do not think so, Mr. Chairman, in the sense of ng able to receive infection. There is a great deal of resist- the action of the parasite and oftentimes they go for a long without actually receiving infection; but sooner or later they le to it.

Chairman. I was just saying to Mr. Haugen here that 40 or s ago the whole part of South Carolina with which I am r was on account of malaria practically given up during the owing season by the white people to the negro tenants. The eople moved up in the mountains, and the large plantations or five or ten thousand acres were left practically in charge gro overseer. That condition, however, is now becoming very etter on account of the discovery that deep wells and screens the mosquito practically protect them from malaria; and untry is now beginning to take up new lines of production develop.

Van Dine. You may say as to negro tolerance that you might 0 negroes and perhaps only 10 or 15 of them would show ms of the disease and have chills with the fever and all that; s an actual blood examination would show that the larger of them had the parasite in their system, which was inactive. r words, they were carriers, or reservoirs of danger, not only rds the disease becoming active in their own systems but in ey offer an opportunity for the disease-carrying mosquito to on them and to really infect the healthy members of their s.

nt to say just a few words about the strictly entomological f the problem, and that is this: Since malaria is conveyed ain mosquitoes which breed in these accumulations of water mentioned, and since the idea of the work is based upon the that the control of those mosquitoes will largely prevent the the study includes the details of the biology; that is, the and habits of the species of mosquitoes that convey the dis- this region.

plantation upon which we are carrying out this work is in er of the Delta region, a region extending from Cairo, Ill., to f, containing the most fertile land in the United States. Any we obtain on this plantation will not apply to all malarial , but to this particular region; yet by comparative study and tion in other regions we can make the results more extensive ly them to other farming regions where the conditions differ.

[illegible] to get information [illegible] the farmers and [illegible]

[illegible] The Bureau of Entomology began the [illegible] over 25 [illegible] The information [illegible] from the standpoint [illegible] there has been [illegible] there have [illegible] mosquitoes—[illegible] the destruction of the Panama [illegible] the people of that territory. But [illegible] the problem of prevention of malaria [illegible]

[illegible]

[illegible] with the [illegible] employed in [illegible] of the human [illegible] of screening and [illegible]

[illegible]

[illegible] the information at [illegible] determining all of the sources [illegible] treatment of cases [illegible] and they [illegible]

[illegible] have to be [illegible] perhaps care to go to [illegible]

[illegible] His responsibility of [illegible]

Mr. HILLESEN. The principles are practically the same, are they not?

Mr. VAN DINE. The principles are the same. But we hope to [illegible] measures that will meet the conditions of the [illegible] of this information that we already [illegible]

Mr. HILLESEN. Are you hoping to find some measure that will not [illegible]?

Mr. VAN DINE. Yes. While no plantation would afford the hospital [illegible] those who are infected, and no farmer would [illegible]

Mr. HILLESEN. Whether they can afford it or not, they could destroy the mosquito with the same methods used in Panama; but you say that is too expensive?

Mr. VAN DINE. Yes, sir.

Mr. HILLESEN. Are you hoping to find some system of destroying the mosquito which will come within the means of the people of the South?

Mr. VAN DINE. Yes, sir. We are working along two lines; not only the destruction of the mosquitoes, but the protection of the human beings from them. For example, take drainage. The problem of drainage is a very important one down there and will some day be carried out, no doubt, and in proportion as that great delta

s drained there will be an eradication of the malaria mosquito consequent eradication of malaria. But until that time comes lantations must act as units, and the plantation owner can go ther than the limits of his own plantation. There is no oppor- for drainage in that region independent of other plantations.

McLAUGHLIN. Has this money been used altogether for inves- onal work, or has some of it been used to pay the expenses of physical labor by way of controlling this thing? You speak of ng and screening and so on.

VAN DINE. We have started some experimental lines of con- In speaking of drainage, the idea has occurred to us that where not get the water off the land we can impound it on the land h a way as not to be a breeding ground of the mosquito.

McLAUGHLIN. Beyond working out the idea, have you been ing any of this money to do it?

VAN DINE. We have; yes, sir.

McLAUGHLIN. How much?

VAN DINE. We have spent in the neighborhood of $500 in the mental work on cleaning and damming a section of one bayou.

McLAUGHLIN. Have you been able to cooperate with the local there?

VAN DINE. Yes, sir.

McLAUGHLIN. And did they furnish the money or any part money?

VAN DINE. No, sir. They furnished a great deal of the labor t of the project——

McLAUGHLIN. But the labor is paid by you?

VAN DINE. We paid for a great deal of the actual labor of ig and cutting the stumps and trees and the grass along the and the building of a spillway. This was undertaken ex- y for the purpose of seeing under what conditions water could ounded in that region, in the absence of drainage, and we will ow until this season what the effect is to be upon the produc- f mosquitoes there, although we feel confident the conditions rendered unsuitable for the development of the mosquito.

HAWLEY. You impounded the waters and then oiled them?

VAN DINE. No, sir; in cooperation with the Bureau of Fish- we are studying the habits and the use of the little top-water ws, and the Bureau of Fisheries will carry the work a little r and include the idea of excluding predaceous fish that would ere with the usefulness of the little top-water minnow. Our f it is to determine the possibility of mosquitoes breeding in water, where wave action also interferes with the larvæ de- nent, the idea being to eliminate all breeding places within a ular area of the plantation or estate and, if we can determine nit of the flight of the anopheles from their breeding source to bin, the plantation can place the cabins in this location. The s favorable as regards plantation operations. We would have eless mosquito area there.

McLAUGHLIN. What is that area of flight?

VAN DINE. We have not determined that fact specifically for ecies we are working on. It varies with different species. It is ered that the distance is not over 700 yards, but we do not

Mr. HAYDEN. When he makes his first flight, can he not be ...ville and then fly again?

Mr. VAN DYKE. There is no doubt a great deal of house-to-house migration the mosquito might reach the main land after he took a boat, go on to another, but in no great numbers.

Mr. HAYDEN. He might go halfway in the time, take a rest, and then go on to the first main?

Mr. VAN DYKE. I think not Boston lies forty-five miles.

Mr. HAYDEN. It is not a long jump.

Mr. VAN DYKE. Down in Panama they say this mosquito has a short flight.

Mr. HAYDEN. In traveling along the road in an automobile, I presume the mosquitoes would get left from them; but with a train a strong force of mosquitoes will follow for miles.

Mr. VAN DYKE. There are instances of them.

Mr. HAYDEN. I am told that the malaria mosquitoes in Virginia, for instance, have been known to fly 10 miles, but in small numbers.

Mr. VAN DYKE. I am thinking about them dying in the air; they do not live as long as the rest of us.

Mr. HAYDEN. These are the malarial mosquitoes. The distance of flight of malaria mosquitoes never exceeds half a mile, according to the best authorities in Italy, India, Japan, and other parts of the world.

Mr. HAYDEN. But after he makes his first half mile of flight and settles down, will he generally make another half-mile flight?

Mr. VAN DYKE. I do not think so.

Mr. HAYDEN. Is not the work you are doing largely a duplication of the work done heretofore—for instance, in the study of yellow fever?

Mr. VAN DYKE. No, sir. It is establishing an entirely new problem.

Mr. HAYDEN. It is a new problem, but does not the same remedy apply?

Mr. VAN DYKE. We are using the same information that was employed——

Mr. HAYDEN. In connection with the study of yellow fever?

Mr. VAN DYKE. Yes.

Mr. HAYDEN. It is practically the same?

Mr. VAN DYKE. Yes, sir. And by the way, this information was not original in that was furnished by the Bureau of Entomology as a result of work on these mosquitoes.

Mr. HAYDEN. But the information obtained heretofore could be applied to this very same thing?

Mr. VAN DYKE. If we knew the conditions.

Mr. HAYDEN. Now, then, what is the remedy? What remedy do you suggest?

Mr. VAN DYKE. For the prevention of malarial infection?

Mr. HAYDEN. Yes: for the prevention of malaria. I am not talking of the country but would like to know about Washington especially.

Mr. VAN DYKE. We know certain measures are effective, such as screening dwellings, draining the marshes, and eliminating the breeding areas, which will eliminate the mosquitoes and thus reduce the ...ence of malaria.

Mr. HAUGEN. We have known that for a quarter of a century. ow, what do you suggest?

Mr. VAN DINE. We do not know, going back to the plantations——

Mr. HAUGEN. What do you suggest doing here in the city of Washngton, for instance?

Mr. VAN DINE. For the eradication of malaria?

Mr. HAUGEN. Yes; it is very necessary.

Mr. VAN DINE. I would suggest that the people interested in the ity of Washington, or whoever is responsible, take up the project of raining the near-by swampy areas or rendering them unfit for the nopheles development, which would probably involve a survey of he city and the environments to determine the sources of the breedng places. Then you would find that each place would probably be a ittle problem in itself—drainage to be undertaken in one place, illing in another, and oiling in another.

Mr. HAUGEN. You referred to breeding places. What did you have n mind? What do you suggest doing here in the city to overcome hat?

Dr. HOWARD. There is no malaria that originates in the middle of he city of Washington.

Mr. HAUGEN. In the middle?

Dr. HOWARD. It used to be that malaria did originate in the city of Vashington, mainly from the old Potomac Flats, but there is very ittle malaria in the city of Washington now that is not brought in y people who come back from their summer vacations with a case f malaria which they have caught in the summer time at the sumner resorts. There is malaria around the city of Washington. Down on the Eastern Branch there is more or less malaria, but that s due to the local breeding ground. The Anopheles mosquitoes I have never found breeding in the city of Washington proper. So it is impossible for it to originate in the city. If we want to reduce malaria about the city of Washington, a good way would be to drain the swamps along the Eastern Branch. The malaria mosquitoes breed there. And there are places of this sort along the Potomac and at Fort Myer, where the Anopheles breed and affect the soldiers out there, but there are no Anopheles bred in the city of Washington.

Mr. HAUGEN. Is it not a fact that a large number of people are affected by malaria? It is not an unusual thing, along in April, to see a dozen Members affected with malaria.

Dr. HOWARD. They must bring it in from the outside, Mr. Haugen. They can not get it unless they get it up the river or some such place as that.

Mr. HAUGEN. What other remedy have you than drainage?

Mr. VAN DINE. Living within screened dwellings, the use of mosquito bars at night, location of cabins, oiling, the use of top-water minnows, the disposal of refuse, and the protection of containers for storing water.

Mr. HELGESEN. But all of this, as a practical proposition, means expense, and you say the plantation owner can not afford to go to this expense; and, another thing, as long as darkies are bred in the South fast enough to supply the labor, there would not be any financial sentiment, at least, to do it?

[illegible] to the extent to which he can go in giving [illegible] That is what we must determine.

[illegible] suppose a pond has these Anopheles mosquitoes [illegible] will there be left some of the [illegible] next year? How long will the [illegible]

[illegible] mosquito would ride over the inactive period [illegible] rest and hibernate as adults [illegible] that was not treated so that it would be unfavorable for [illegible] these pests would manifest the trend again.

[illegible] carried forward for two [illegible]

[illegible] would have to be gone over [illegible] mosquitoes from breeding [illegible] or fish introduced [illegible]

[illegible] is the financial proposition. If [illegible] will it take to oil [illegible]

[illegible] gather on the vegetation [illegible] of water, attention merely [illegible] sediment. An ounce of oil will [illegible] applied very easily [illegible] walking around the margin.

[illegible] oil on the water and let it [illegible]

[illegible]

[illegible] spray with a sprayer.

[illegible] distributed the oil with a [illegible]

[illegible] done by the Government of the [illegible]

[illegible]

[illegible] the greatest economy in the use of oil by [illegible] the surface.

STATEMENT OF DR L. O. HOWARD, CHIEF OF THE BUREAU OF ENTOMOLOGY—Continued.

The CHAIRMAN. Now, Dr. Howard, I wonder if you could not briefly state the other lines of investigation which you have there that have not been covered?

Dr. HOWARD. Very good, sir. The next problem is the house-fly control in relation to manure. The great majority of house flies breed in horse manure, and the great problem has been to treat the manure pile in such a way as to kill the maggots and not to injure the fertilizer value of the manure. Under the experiments that were carried on we found that borax in the proportion of three-fifths of a pound to 8 bushels of manure put on the manure pile would stop the breeding of the maggots. However, borax-treated manure when used very heavily on the truck gardens seemed to retard the growth of the crops, and therefore it was found necessary to find a better

treatment for manure used on this class of crops. In consequence, the bureau has worked out a substitute for treating with hellebore without injuring the fertilizer value of the manure to destroy the maggots.

Mr. McLAUGHLIN. Will you tell us the cost of that?

Dr. HOWARD. The cost is very slight.

Mr. HUNTER. Three-quarters of a cent a day for the manure from a single animal.

Dr. HOWARD. Another point has been to develop plans so that it is possible for a man to construct in his stable a place for the piling of his manure in such a way that the manure will automatically relieve itself of the maggots. Out in Maryland, on the Agricultural College farm, a cement platform existed about which we built up a slight wall and covered it with spaced scantlings, and the manure was carried out daily and placed upon those scantlings and occasionally a spray of water was thrown over the manure. The maggots, when they get to be full grown, have a tendency to migrate to the bottom of the pile, and under these conditions when they migrate to the bottom of the pile they fall through this scantling into a cement basin where they are killed by the water which is there. By that means it is possible for the farmer who has half a dozen or more horses in his stable to construct at an expense of about $20 a receptacle of this kind for his manure which will automaticaly destroy the house-fly maggots.

In regard to the control of the house fly and other insects in establishments operating under Federal meat inspection, which is rather a serious problem, in that it introduces a number of possible new breeding places for the house fly, I have a statement here which I will file, Mr. Chairman, in order not to take further time of the committee.

(The statement referred to follows:)

CONTROL OF HOUSE FLIES AND OTHER INSECTS IN ESTABLISHMENTS OPERATING UNDER FEDERAL MEAT INSPECTION.

Fly control about packing establishments is one of the most difficult problems in sanitation with which the meat inspectors of the Bureau of Animal Industry have had to deal. The importance of this question has been recognized from the first, and last year the Bureau of Entomology was requested to cooperate in work looking toward its solution.

That the house fly carries a number of dangerous diseases of man has been fully demonstrated. Blowflies are also capable of carrying filth and germs. These various species are at times a veritable scourge about establishments where animals are slaughtered and various meats and meat products are prepared for food. They are far worse as pests about slaughter pens which are not subject to Government inspection. Hence this is a question which affects the cleanliness and wholesomeness of our entire meat supply, as well as oleomargarine, butterine, and other food products. The problem involves the investigation of the ham skipper, which is responsible for losses in hams and bacon amounting to thousands of dollars annually.

Methods of controlling another disease carrier, the cockroach, about packing houses is also to receive attention.

Owing to the number of species concerned, the diverse breeding habits of these, and the many different breeding conditions offered about packing establishments, many of the well-established practices in fly control are rendered inoperative or require special application.

Dr. HOWARD. The next item is the investigation of insects affecting the health of animals, and for that project we are asking for this increase of $7,000.

The CHAIRMAN. Tell us about the increase, please, sir, in that connection.

Dr. HOWARD. I have statements here covering that point, but in regard to the general problem of insects I would like to ask Mr. Hunter to address the committee briefly.

The CHAIRMAN. All right. Mr. Hunter, let us hear from you on that briefly, please.

STATEMENT OF MR. W. D. HUNTER, BUREAU OF ENTOMOLOGY, RELATIVE TO INVESTIGATIONS OF INSECTS AFFECTING THE HEALTH OF ANIMALS.

Mr. HUNTER. Mr. Chairman, this whole subject of the work on insects affecting the health of domestic animals is a rather new one in the bureau. Up until the recent reorganization of the department took place work along this line was of rather uncertain jurisdiction. Thanks to the provisions made by this committee for the reorganization, this matter has been gone into thoroughly by our project committee, and the line of demarcation between the work of the Bureau of Entomology and the Bureau of Animal Industry has been made very plain.

Following the work of the project committee, the bureau has outlined a number of projects along this line with an aggregate expenditure of something like $7,000. The projects involved small amounts, like $500 and $500, and $1,000 in another case. The purpose of this is to lay the foundation for serious work in the investigation of a number of important pests of live stock which have received very little or no attention in this country. In that class of insects we think some of the most injurious species which occur in the United States are, for instance, the ox warbles, which have been estimated conservatively to cause an annual loss of something like $[illegible]

Mr. HAWLEY. How much?

Mr. HUNTER. $[illegible]

Mr. HAWLEY. What is this pest?

Mr. HUNTER. The form in which the pest comes to attention generally is the so-called warbles, or wolves, in the backs of cattle. The adult insect is a fly, which deposits its eggs on various parts of animals. The eggs hatch in a very short time, and the larvæ make their way [illegible] the tissues beneath the skin and live for the greater part of the year.

Mr. HAWLEY. Is that not the same thing as the farmers call grubs?

Mr. HUNTER. Exactly.

Mr. ANDERSON. If the estimates of losses by everybody who has testified before this committee are correct the farmers of this country [illegible] of them bankrupt.

Mr. HUNTER. The estimate of $[illegible] in this case is based [illegible] very careful survey of the country that was made several years ago by one of the agricultural papers in Chicago. The losses [illegible] of several classes. The most notable loss is in the case of hides. The value of the hides has been determined by circularizing the tanners, and the loss per hide amounts to something like $1 on account [illegible] But the greater loss and the most tangible one is

in the reduced vitality of the animals. They respond less readily to feed, and the milk production is reduced.

Mr. HELGESEN. Before you get away from hides—if my memory serves me right, there is only about 40,000,000 to 45,000,000 hide animals in the country, and only a portion of those is slaughtered each year, and only a certain percentage of those slaughtered have any grubs.

Mr. HAUGEN. How many?

Mr. HELGESON. It used to be 60,000,000, but it has been reduced until the number of animals in the country is only about 45,000,000.

Mr. HAUGEN. If 45,000,000, at $1 a hide, that would make it $45,000,000, would it not?

Mr. HELGESEN. Yes; but they do not kill all of those animals.

Mr. HAUGEN. They do not sell the hide until the animal is killed.

Mr. HELGLSEN. No.

Mr. HAUGEN. They do not sell the hide until the animal is killed.

Mr. HELGESEN. No; that is what I say—that there are only so many cattle in the country, and if they killed them all it would not be that much.

Mr. HUNTER. As I remember the estimate of the loss from injury to hides it amounted to about $15,000,000. It is true that the injured hides do not occur throughout the year. The insects are beneath the surface for nine months in the year, but during the three months, or during the warble season, practically every hide suffers this loss.

The two particular matters for which an increased estimate is submitted are these: In the Northwestern States, particularly Montana and North and South Dakota, a new European insect has recently been found to exist, known as the nose fly of horses. It is a species of fly which deposits its eggs on the face or the lips of the horses, and when they hatch they make their way into the alimentary canal, where they cause various disturbances. We have throughout the country another species of similar habits that is called the bot-fly of horses. There is every indication that this recently-introduced species will spread throughout the United States. In fact, the concentration of horses at St. Louis and Chicago recently for export has had an important bearing on that matter.

Mr. HELGESEN. This nose fly—just to show you how recent that is, I had never known of that until I went home last summer, and every horse on the farms was wearing a fringe around his nose to protect it and prevent this fly from getting up in there.

Mr. HUNTER. The serious economic feature of the situation is that this fly is most active at the very time when there is the greatest demand for the work of the horse. It is coincident with the harvesting of the grain. The horse has a very strong instinctive fear of this insect when it approaches to deposit its eggs; they become frantic, and the farmers must resort to all sorts of head devices to protect them.

Mr. HELGESEN. What would be the result to the horse if the fly did deposit its eggs?

Mr. HUNTER. Various disturbances take place. A great many of the horses die on account of the obstruction of the alimentary canal and an interference with the functions of the stomach due to large masses of the bots.

Mr. HELGESEN. That is bots. I was referring to the nose fly; is that the same thing?

Mr. HUNTER. Yes; it causes a different form of bots.

STATEMENT OF DR L O HOWARD CHIEF OF THE BUREAU OF ENTOMOLOGY—Continued

Dr HOWARD The matter of the mosquito, briefly, Mr. Chairman. The suppression of malaria, like the prevention of bubonic plague, the suppression of yellow fever, and the prevention of any of these insect-borne diseases, is a matter for economic entomologists rather than for the medical profession, and it is on one point where we would perhaps be supposed by the Public Health Service to be infringing on their ground. But we justify ourselves not only on account of our special knowledge of mosquitoes and allied insects, but also because of the fact that it becomes particularly an agricultural problem which especially appealed to the Secretary of Agriculture, who is an agricultural economist, and he has urged the continuance of this work. The work is strictly entomological and experimental work, and can be carried on by trained entomologists better than by any other class of people.

The CHAIRMAN. It seems to me, if you are not doing it now, that it would be very well in this work to continue to cooperate with the Public Health Service, and I should like to ask if you are doing that now?

Dr HOWARD We are only too glad to cooperate with them when opportunity arises. I hold the honorary position of consulting

mologist to the Public Health Service. As a matter of fact, e has been very little cooperation. There seems to be a tendency he part of the Public Health Service to avoid cooperation.

Mr. ANDERSON. That is an unfortunate attitude.

Mr. HOWARD. But justified, perhaps, in the pride they have in r own service. They consider themselves competent to cover hese questions.

The CHAIRMAN. You justify this appropriation on the ground that economic relationship that these insects bear to agriculture is an cultural problem?

Mr. HOWARD. That is our main reason for entering this field, ough, as a matter of fact, most of the studies that have amounted nything concerning the mosquito extermination and that sort of g have been done in the Bureau of Entomology. The operations uba and Panama were based in large part upon studies made in bureau.

The CHAIRMAN. You recall, of course, that the committee, when work began several years ago, allowed this item rather reantly, I think.

Mr. HOWARD. Yes; I remember.

The CHAIRMAN. In the fear that there might grow up two branches he service doing the same kind of work; and I think it is the e of the committee, which I want to express to you, that you keep r lines pretty distinctly marked out.

Mr. HOWARD. We have tried to do so, sir.

The CHAIRMAN. Take up your item No. 43, Doctor, of $3,000 for eral administrative expenses connected with the above lines. This is to be a new item.

Mr. HOWARD. That account has always been included under the head miscellaneous insects and miscellaneous work, and the explanation is, I think, perfectly plain—that we need more help in that eral direction. We are overcrowded and overwhelmed with work hat direction.

The CHAIRMAN. What do you mean by administrative work, tor?

Mr. HOWARD. Such items as I mentioned before in regard to the eling expenses of the chief and assistant chief when on their s of inspection of the 75 field laboratories of the bureau, the oconal employment of extra help of a general character, and mat- of that sort.

The CHAIRMAN. This means really an increase in the items from ch it is drawn, because there has been no reduction from those is in proportion to this?

Mr. HOWARD. Yes; it means an increase; and I was about to exn that. In connection with this identification and classification k we have boxes piled on our desks, and we need one or two more erts, particularly in regard to classification of parasitic insects.

The CHAIRMAN. All right; take up your item, then, on the gipsy h.

Mr. HOWARD. Gipsy moth and brown-tail moth investigations. It is the appropriation for preventing the spread of moths. The erent projects are well explained in the program book. I have ught with me a map indicating the distribution of the gipsy and wn-tail moths. The outside blue line [referring to map] shows

[illegible]

Dr. HOWARD. We have already distributed [illegible] and will distribute 10,000,000 more this [illegible] of the egg parasites imported from Europe.

Mr. HAWLEY. Do you expect to eliminate those moths from that [illegible]?

Dr. HOWARD. No, sir; we do not expect to eliminate them by the [illegible] but we expect to reduce their numbers.

Mr. HAWLEY. Do you ever expect to eliminate them by any means?

Dr. HOWARD. No, sir. Massachusetts lost its chance, I think, to exterminate the gipsy moth, if it is ever possible to exterminate insects of that kind. In 1900 there was an area of 400 square miles around Boston, which was the only area infested, and they had been undoubtedly exterminated in certain towns. At that time the State dropped its appropriations for five years, and in 1905 they had spread from an area of 400 square miles to an area of 4,000 square miles, and it was a year after that before the Government began its work.

The CHAIRMAN. In answer to Mr. Hawley's question, you say it is not your hope to ever exterminate the gipsy and brown-tail moths?

Dr. HOWARD. I am afraid we shall never be able to exterminate them.

The CHAIRMAN. Your position now is one of control?

Dr. HOWARD. Our position is now one of control and protection to the country.

The CHAIRMAN. Quarantine and control?

Dr. HOWARD. Quarantine and control. We have protected the rest of the country. There is no doubt about that. The appropriations that Congress has made for the past eight years have undoubtedly relieved the country from a great scourge.

The CHAIRMAN. This appropriation, therefore, may as well be considered a permanent appropriation, you might say?

Dr. HOWARD. I fear so. It may be that the parasites will reduce the species to such a number that we can rely simply on quarantine measures.

The CHAIRMAN. Of course, you regard this appropriation as an investment, as an insurance, not as an investment?

Dr. HOWARD. Certainly, as an insurance. Since the passage of the Federal horticultural law there have been a number of what might be called commercial jumps. Gypsy-moth eggs have been carried on nursery stock or building material from the infested zones to other parts of the country. One colony was discovered three years ago near Cleveland, Ohio, in the suburbs. It was exterminated. One was discovered at Geneva, N. Y. It was exterminated. One at Rutherford, N. J., the year before last, has apparently been exterminated. Another was found two years ago in Westchester County, N. Y.; we are scouting at the present moment without finding any egg masses so far this winter.

Mr. HAWLEY. Do you allow any forest products to go out from this infested territory?

Dr. HOWARD. Not without having been inspected and certified by our inspectors. Further than that, some of the States do not allow forest products to come into their State even when they do bear inspection certificates. Last year we allowed evergreens used for Christmas trees to go out under inspection. The cost of inspection is very great, and at a recent meeting of the United States Association of Horticultural Inspectors the threat was made that, unless the Federal Horticulture Board put a ban upon exporting Christmas trees from that section, each one of their States would refuse to receive them.

Mr. LEE. What do these moths work on principally?

Dr. HOWARD. All forest, fruit, and shade trees, even the leaves of evergreens. They have certain favorite food plants upon which they work when young, and when they are fully grown they will go to other trees. They are very large caterpillars. They will feed upon pine, spruce, and firs only when they are full grown. That is to say, a pure stand of conifers will not be damaged by them, but it is the mixed forests where they are able to flourish because in their early stage they feed on the leaves of birches, alders, and oaks, and then when they are fully grown they will come from these trees to other trees and eat the leaves off in a couple of days.

The CHAIRMAN. I presume you have the figures in your office, if not in your head, showing the area in which this infestation occurs. I should like to have the record show that and also what spread has taken place during the past year.

Dr. HOWARD. Yes, sir; I can give you the exact figures. It is shown by this map here. The only spread has been below these townships that are colored pink. At the same time there are certain townships like these colored brown in which the gipsy moth was found two years but has not been discovered since.

Mr. HAWLEY. How near are they up to the White Mountains now?

[illegible]

[illegible]

[illegible]

Mr. HOWARD. In cases of accident?
Mr. ANDERSON. Yes.
Mr. HOWARD. I am not familiar with it. We never had authority to anything of that sort before.
Mr. ANDERSON. It strikes me that before any language of this kind authorized we ought to have some information as to how any ount which is appropriated will be administered.
Mr. HOWARD. In regard to compensation for accidents?
Mr. ANDERSON. Yes.
Mr. HOWARD. I shall have to refer you to the operation of the est Service in regard to that, sir.
Mr. HELGESEN. Do you have any cases of accidents or injuries?
Mr. HOWARD. Very few; but there has been some of both.
Mr. HELGESEN. How many?
Mr. HOWARD. I do not know. I can not tell you.
Mr. ANDERSON. Personally, I believe in compensation for accits or injury, but, if we are going into that field, I should like to it done in such way that it will be practically uniform throughout different services of the United States.
The CHAIRMAN. As I understand, Mr. Anderson, this language s in analogous to that carried last year or the year before under Forest Service. Mr. Harrison calls attention to the fact that t provision is now in effect in the Forest Service and to the fur- fact that this does not contemplate compensation. Probably Mr. rison can make a short statement here.
Mr. HARRISON. I have no detailed information as to how the For- Service provision is administered. I know, however, that its pose is simply to extend immediate relief to employees engaged hazardous work who are injured in the course of their official du- in the field.
The CHAIRMAN. It is not a compensation act?
Mr. HARRISON. No, sir; it is not a compensation act. I may say, wever, that the act of March 11, 1912 (37 Stat., 74), extended the visions of the compensation act of May 30, 1908 (35 Stat., 556), the employees of the Forest Service. The employees of the Bu- u of Entomology, however, do not receive the benefits of the act l will not if the provision under consideration is adopted.
Mr. ANDERSON. Of course, if it is limited to immediate relief in es of injury, no doubt it ought to be allowed. I simply wanted get some idea as to what the extent of the compensation act uld be.
Mr. HARRISON. It is not a compensation act in the slightest. It is ply to provide for the extension of immediate relief to employees o may be injured in the course of their official duties in the field.
The CHAIRMAN. Do you have a great many of these accidents, ctor?
Dr. HOWARD. Not a great many. They have not reported them to head office, but the man in charge, Mr. Burgess, tells me they asionally have them.
The CHAIRMAN. If there are no further questions, we are very ich obliged to you and your colleagues for your statements, Doc-

(Thereupon, at 12.20 o'clock p. m., recess was taken until 3 p. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Tuesday, January 18, 1916.

The committee met at 10 o'clock a. m., Hon. Asbury F. Lever (chairman) presiding.

The CHAIRMAN. We have met this morning to hear some gentlemen from Michigan in regard to cucumber diseases and truck-crop diseases in that section of the country. This hearing was arranged for by Mr. McLaughlin, and I would like him to present the speakers.

I would like to say that we desire to complete this hearing as quickly as possible. Of course, I want the members to feel free to ask all the questions they want, but we will have Prof. Jaggar a little later on the volcano proposition.

Before beginning the hearing, I suppose this is about as good a place as any to ask the clerk to read a letter from Gov. Ferris, addressed to Hon. Frank E. Doremus, so that it may become a part of the record.

(The letter referred to, which was read by the clerk, follows.)

STATE OF MICHIGAN, EXECUTIVE OFFICE,
Lansing, January 11, 1916.

Hon. FRANK E. DOREMUS,
Washington, D. C.

MY DEAR MR. DOREMUS: In this letter I may possibly get some of my information twisted; I hope not, however.

I wish to call your attention to the pickle industry so far as it concerns the State of Michigan. In 1910 and 1911 the average amount received by growers in Michigan for cucumbers was $79.02 per acre; in 1913 and 1914, after the plant diseases became serious, $39.37. This means a loss of $39.65 per acre, or a total of $1,137,955 less per annum for their cucumber crop than they would have received prior to the development of the disease.

Already Congress has appropriated $5,000 for investigation of these diseases. The money has been wisely spent. The problem has not been solved. It now seems it is necessary to have the cooperation of the head of the Entomological Bureau at Washington. If this department can take up the results of the investigation as conducted by the Agricultural Department, there is a possibility of not only helping the cucumber raisers in Michigan but the cucumber raisers in many other States. The diseases are not confined to any one State or any one locality; they are general and threaten the destruction of this industry.

The budget has now gone in, so to speak. The House committee must now be appealed to for the insertion of a clause for an appropriation to carry out these proposed further investigations. As governor of Michigan, I appeal to you. I want you to investigate for yourself. Your brother Congressman, James C. McLaughlin, will be able to explain to you fully the situation.

I ask you to consult Mr. McLaughlin, and then, if his statements appeal to you, use your best influence with the committee of the House of Representatives to have the proper appropriation made. Please do not let this seem like a small matter. I have spent a good deal of time in making inquiry concerning this industry. Think of it. There were 100,000 acres contracted for pickles in 1915. There are a thousand pickle stations in the United States. The aggregate amount of money invested in the pickle industry in the United States will amount to at least $35,000,000. This industry affects favorably other allied industries.

All we are asking is that an appropriation of $5,000 be allowed the Bureau of Entomology for the purpose of getting some value out of the investigations already made by the Department of Agriculture, in order that the best possible efforts may be made to save this industry.

Very cordially, yours,

WOODBRIDGE N. FERRIS, *Governor.*

The CHAIRMAN. Before we begin, Mr. McLaughlin, let me make this inquiry: My recollection is that a provision was inserted last year on the floor of the House carrying $5,000 in the appropriation for the Bureau of Plant Industry for this work. Is that correct?

Mr. MCLAUGHLIN. The appropriation available for this kind of work in the Bureau of Plant Industry was increased, at my request, by $5,000.

The CHAIRMAN. The proposition this morning is to add $5,000 to the estimates of the Bureau of Entomology, so that the Bureau of Plant Industry and the Bureau of Entomology may cooperate; is that correct?

Mr. MCLAUGHLIN. I think that will be determined by what these gentlemen from the two bureaus say. The money last year was placed at the disposal of the Bureau of Plant Industry, but I understand it is a matter that can very properly be studied also by the Bureau of Entomology, and for that reason Dr. Howard was asked to be present this morning. I do not know whether there should be an appropriation for each bureau or whether the one appropriation will be large enough to cover all of the work and the money given to one bureau to pay for the work of both.

The CHAIRMAN. Dr. Taylor and Dr. Howard, the chiefs of those two bureaus, are here this morning. Let me inquire, gentlemen, whether you have decided in reference to that.

What is the proposition, Dr. Howard?

Dr. HOWARD. The idea, Mr. Chairman, I believe, is to have the Bureau of Plant Industry continue the work another year under their present allotment and to put in $5,000 additional for the Bureau of Entomology, and to have the two bureaus cooperate on this project.

The CHAIRMAN. Is that your thought, Dr. Taylor?

Dr. TAYLOR. Yes. The work which is now under way under the appropriation for this year is exclusively devoted to the investigation of the diseases. In the investigation of the diseases, the necessity for further knowledge in reference to insects that attack cucumbers and which bear a close relation to the transmittal of certain of the diseases has come up, so that the question as we have it in mind is the providing of an additional appropriation for the Bureau of Entomology for insect investigation.

The CHAIRMAN. So that it would be really an increase of $5,000 for this work.

Dr. TAYLOR. Yes, for the Bureau of Entomology.

Mr. MCLAUGHLIN. Suppose we let Dr. Howard point out in the estimates for his bureau the item that we are to increase.

The CHAIRMAN. I would like to ask Dr. Howard, before he does that, whether his estimates include an increase for that work?

Dr. HOWARD. No, sir. The condition about these diseases being carried by insects has been brought to my attention only recently—within the last two or three weeks. We did not recognize the importance of the insects in this work until very recently. The investi-

[illegible] APPROPRIATION BILL

[illegible]

[illegible] Mr. [illegible] to ask Mr. Lowden [illegible]

[illegible]

[illegible]

[illegible]

[illegible] THE CHAIRMAN.

[illegible]

[illegible]

Mr. [illegible] gentleman from Mr. Elston was [illegible] and we would like to hear from him.

STATEMENT OF HON. [illegible] ELSTON, [illegible] REPRESENTATIVE OF THE [illegible] FIFTH DISTRICT OF PITTSBURGH, PA.

[illegible] Mr. Chairman and gentlemen of the committee, I [illegible] to be here to-day to speak in favor of the proposition [illegible] now a part of the pending [illegible] to appropriate $1,000,000 [illegible] for the purpose of [illegible] the Mississippi River [illegible] I have been in my district a [illegible] of the [illegible] showing [illegible]

[illegible] $1,000,000 [illegible] Mississippi River [illegible] We feel very [illegible] a good deal more [illegible]

[illegible] that it takes [illegible] during the season [illegible] We are also quite sure that the [illegible] We feel confident that it should be [illegible] people regularly employed [illegible] pickles from the time they are [illegible] the preserving, processing, and manufacture of the pickle product until they reach the retailer. That [illegible] in the way of statistics for the United States.

I want to come back for a moment, Mr. Chairman, to the pickle industry in Michigan and to say that I have here in my hand a list of 415 stations in the State of Michigan; 415 stations with an average acreage of 112 acres per station makes 46,480 acres contracted to pickles in 1915. In 1911 an average of $79.02 per acre was paid to the growers of Michigan. In 1914 the average amount paid to the growers per acre was $30.37, and in 1915 it averaged the small sum of $[illegible] per acre. I am basing this on an average acreage of between [illegible] and 9,000 acres in different parts of the State, taken from the records and taking that as a general average. Now, then, the difference between the amount of money paid to the growers in 1911 and

915 was $52.79 per acre; between 1911 and 1914 it was $39.65. In 915 we had some frosts and some storms that cut down the average, nd so we do not feel that it is fair to use those figures for purposes of omparison in showing the ravages of the diseases and insects; but e do believe that the difference between the 1911 and 1914 yields er acre and the money paid the farmer per acre in 1911 and in 1914— difference of $39.65—is a fair basis for estimating the total loss to he growers of Michigan from these diseases in 1915.

Mr. HELGESEN. How did the prices compare in 1911 with this year?

Mr. ELLZEY. We are paying more now than we did in 1911—about 5 per cent more.

Mr. HELGESEN. How about 1914, the year you compare with 1911?

Mr. ELLZEY. In 1911 we paid 75 cents per bushel for No. 1 pickles nd in 1914 we paid $1 a bushel.

Mr. HELGESEN. And still you had a loss?

Mr. ELLZEY. And still we had that difference of $39.65 per acre. Basing that on the average for last year, the 1914 average, and not the average of $26.23, we actually paid the farmer in 1915, we have he enormous sum of $1,842,932 as the loss to the growers of Michigan st year. And I would like to call your attention to this fact, gentlemen, that the man who grows pickles is the poor farmer, financially, he is the small truck farmer who has to grow small truck crops and t a cash price for them, in order to make his living. Taking this me estimate as a basis, on the 100,000 acres planted last year in the nited States you would have practically a $4,000,000 loss to the owers. And we feel sure that that is a very, very conservative estiate, because this report that I have mentioned shows only 306 ations in Michigan, whereas we know—because we have a list—that here are 415 stations; and there are probably nearer 1,200 stations the United States than there are 1,000, although we have a report ere which gives only 781 stations. It is utterly impossible to get ccurate statistics at this time. Mr. Gilbert, of the Bureau of Plant ndustry, can give you those facts.

Mr. HELGESEN. Do the conditions you have described in Michigan revail all over the United States?

Mr. ELLZEY. Yes, sir; it is practically true all over the United tates.

Mr. HAUGEN. How is this list obtained; from some department?

Mr. ELLZEY. Yes, sir, from the Department of Agriculture, through Mr. Gilbert and through the county agents.

Mr. MCLAUGHLIN. In what States are pickles largely grown?

Mr. ELLZEY. Pickles are grown for manufacturing purposes in Michigan, Wisconsin, Indiana, New York, Ohio, Virginia, Missouri, Colorado, Minnesota, California, Mississippi, and, I think, Alabama. We used to be in Alabama, but we are not operating in Alabama now.

Mr. MCLAUGHLIN. Are these diseases found in all the States you ave mentioned?

Mr. ELLZEY. We are not operating in Alabama. We are operting in seven States and they are found in those States where we re operating.

Mr. MCLAUGHLIN. To about the same extent?

Mr. ELLZEY. In some seasons it is worse than in others.

The CHAIRMAN. When was this disease first discovered in your rucking industry, Mr. Ellzey?

controlling or
is Federal aid in the
remedy and need Federal

for Federal aid finan-
who know how to handle
to come from the depart-

find a remedy if you had

the Bureau of Plant Industry
in a few moments and they can
and the results. But I will
opinion of all the men in the
of Indiana, Michigan, and Wisconsin
and we must have the active cooperation of the
Bureau of Entomology in order that the insects which carry the
diseases from vine to vine and which carry them over during the
winter can be either eliminated or controlled. This is necessary
before we have any hope of controlling the diseases in a large way.
We have made some progress, but it is a matter of years before
we will get to the goal we are after; we feel sure of that.

The CHAIRMAN. You have discovered, then, that your trouble is not confined entirely to the plant-disease side of the situation but that you also have the insect problem, too?

ZEY. Mr. Chairman, we are confidently convinced, beyond of a doubt that the insect side of this proposition is 50

ELLZEY. Yes, sir; it not alone it will eat through until the plants
on it is real young and tender. In addition to that, it lays an
l the larvæ which hatch out go into the root of the plant and
plant after it begins to bear; after the farmer has thinned out
ts, has a nice stand, and they begin to produce, then a little
or larva, of this bug attacks the root of the plant and kills it.
an that, it bites the plant that is diseased and, like the fever
ries the disease to a plant that is not infected and kills it.
HAIRMAN. Can you control this beetle by the application of
or any of those various poisons?
LLZEY. That is what we want your Bureau of Entomology to
ne.
HAIRMAN. You have not determined that?
LLZEY. No, sir; we have not.
HAIRMAN. Are you an entomologist yourself?
LLZEY. No, sir; just a farmer.
HAIRMAN. You are a good-looking farmer.
ELGESEN. It is getting so now that you can not tell a farmer
y other man. [Laughter.]
cLAUGHLIN. That is the kind of farmers we have in Michigan.
HAIRMAN. All right, Mr. Ellzey.
LLZEY. We have come to the conclusion, as I said before, that,
e going to conquer these diseases, we will have to have the
ooperation of the men who know how to conquer them.
admit that we do not know how, and the men we have
d admit that they do not know how. We have made some
rogress and have found some repellants for the bugs, but it
t entirely control them.
HAIRMAN. What are these diseases?
LLZEY. There are six diseases that menace the cucumber-
rop of the United States; the scab, mosaic, bacterial wilt,
leaf spot, anthracnose, and downy mildew.
AWLEY. How many of those attack the cucumber?

Mr. [illegible] graphs there. What photo-

Mr. [illegible] Mr. Chairman. of the Bureau of Plant [illegible] and did the work this summer, can [illegible] better than I can.

[illegible] Mr. Chairman, and I hope you will give us [illegible] Bureau of Entomology.

The CHAIRMAN. Mr. Barnhart of Indiana is present and would [illegible] of the time of the committee.

STATEMENT OF HON. HENRY A. BARNHART, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF INDIANA.

Mr. BARNHART. Mr. Chairman and gentlemen of the committee I have [illegible] to state my business, although I am a farmer [illegible]

The CHAIRMAN. The same comment that was made regarding the other gentleman is equally applicable in your case.

Mr. WILSON. It is perfectly visible. [Laughter.]

Mr. BARNHART. I thank you for those kind words.

Very briefly, I want to thank the committee, at least the members of it who have been members for some time, for the excellent work they have done throughout at least northern Indiana by a small appropriation that was generously added in your bill in 1912, for an investigation of an attack by disease of the onion crop in the congressional district which I represent.

1910 the discovery was made that in the muck lands that
tofore been thought to be practically useless, which were
from $10 to $25 an acre, by draining those and using cer-
lizers and a certain amount of potash, from 400 to 700
onions per acre could be raised. The industry was under-
a very large scale, but all at once, notwithstanding the care
tion that was given the onion crop, the plants commenced
d this misfortune became so general that people virtually
ng onions. It was suggested that some biologist or some
gist, or whatever you call them, from the Department of
re might suggest some way by which this disease attacking
industry might be eliminated. And your committee put
propriation bill, by way of amendment, I believe, on the
ie House, through the kindness of your chairman and the
rman, $5,000 to be used by the Agricultural Department in
ing the so-thought disease of the onion crop. They sent a
ndiana, who worked throughout the onion district for a
they discovered the trouble to be due to thrips, and that it
disease at all.
gestions, at meetings called here and there, they admon-
onion growers to do two things. One was to keep their
erfectly free, if they could, from foreign substances in the
fertilizer, especially any from Chicago; and the other was
heir ground scrupulously clean. They were advised when
crop was off to rake all the onion stalks and the cornstalks
burn the grass along the fences. And you may be sur-
ien I tell you that the onion lands, which had dropped
that you could not afford to farm the lands at all, within
came back and are producing something like 600 bushels
gain.

eans a whole lot to the farmer. I am not here talking for
manufacturer, but I am here talking for the producer, the
reator of the products.

BEY. That appropriation of $5,000, then, was well spent?

RNHART. That was worth, in my congressional district, a
llars alone to the farmers of that country and, incidentally,
ople of the entire country. Onions, you know, sell for
ushel, and a farmer with 1 acre can produce enough from 1
ted to onions to provide a living for the average small
He can take his wife and children and cultivate an acre of
d get as much profit out of that acre, with a good crop and
es, as the average man gets from 30 or 40 acres of corn.

e same thing is true of the pickle industry. We have there
gressional district which I represent a large number of salt-
ns, located at many of the smaller towns that have a rail-
on. A few years ago the farmers were very enthusiastic in
try and made a great deal out of it. In recent years, how-
especially last year and the year before, the universal com-
ne that the pickle crop was dying from a blight. I went
ome of the fields myself and I discovered that instead of the
the cucumber plant being green they were white, speckled
l the roots, when you pulled them up, seemed to be afflicted
ease. The entomologist there who came to look after the
ease said he thought it was an insect.

STATEMENT OF DR WILLIAM A TAYLOR, CHIE
BUREAU OF PLANT INDUSTRY.

The Chairman. The next upon the diseases of cucumbe
Bureau of Plant Indus
paragraph.

The Chairman. The estimates
The Chairman. Of the estimates the appropriation
diseases of truck crops, forage
stations. The appropriation this year is $50
estimate for next year $50,000.

The $10,000 increase is recommended for another purp
work. The cucumber disease work really began
appropriation of last July the project having
the causes of diseases of the cucumbers, especially those
losses in the pickle-
and to develop and test methods for their co
disease resistant varieties and to determine the effect
setting of cucumber fruit.

Under the present work has been, and is being prose
States of Michigan, Wisconsin, and Indiana, in
with the State experiment stations of those States wh
already been instituted, had made a beginning of th
The effort has been made to so correlate the
State experiment stations upon these diseases with
Bureau of Plant Industry, that there shall be an effecti

r. TAYLOR. I should mention that the H. J. Heinz Co. in its coop-ive relations with the three stations which have already been tioned is also concerned in the undertaking.
he CHAIRMAN. Have you control of the funds appropriated by the nz Co.?
r. TAYLOR. No, sir; that appropriation, as I mentioned, is pri-ily to the three State stations, it having been an arrangement red into prior to the beginning of the work of the Bureau of Plant ustry.
r. MCLAUGHLIN. If the $59,000 asked for under this subappro-tion is allowed, is it your purpose to use $5,000 of that money to inue this cucumber investigation?
r. TAYLOR. Yes, sir; the same money we are using this year. $3,000 increase submitted in the estimates for this item is for a rent purpose.
r. MCLAUGHLIN. It says here, "The above increase of $3,000 is red for extending the cotton-disease investigations." But uded in that $59,000 there will be $5,000 available for cucumber ases, and it is your intention to use $5,000 for that purpose?
r. TAYLOR. It is in connection with work already under way.
he CHAIRMAN. Shall we hear from Mr. Gilbert now or Dr. Orton?
r. TAYLOR. Dr. Orton.

TEMENT OF DR. W. A. ORTON, BUREAU OF PLANT INDUSTRY, DEPARTMENT OF AGRICULTURE.

r. ORTON. Mr. Chairman and gentlemen of the committee, I take at you wish to hear from me some of the details of the work done he Bureau of Plant Industry during the past year, and more par-larly of the nature of the diseases.
wish to say, in the beginning, that the cooperation between our eau, the States, and the Heinz Co. has given us a remarkable ctive working plan. The results from the $5,000 appropriation year are very large in comparison with what would otherwise e been the case.
s you have already been told, we find upon analyzing our problem t we have six diseases to deal with in the cucumber pickle districts. all of those are present everywhere or every year; but in one e or another we have them to deal with. They are not all of al importance either. We consider the scab and the mosaic ase to be the two most serious ones.
he mosaic is the disease photographed here (exhibiting picture), sing a blotching of the pickles and greatly reducing the yield. It causes a similar blotching of the leaves and a dwarfing of the nt.
s shown by the photographs (exhibiting), it may result in the truction of the plants. In the upper picture a lead pencil is stood ide a deseased plant to show how very much it is dwarfed. I call r attention also to those two plants, which were infected by aic, by placing on them a few aphids taken from diseased vines, s demonstrating the effect of the insects in conveying the disease n one plant to another.

Mosaic is a disease which is transmitted from plant to plant by insects of some kind in somewhat the same way as the germ of malaria or yellow fever is carried by insects.

One of the important and significant features of the pathological work of the [illegible] season has been to reveal the nature of this heretofore mysterious unknown disease which had been called the "white pickle" a disease of comparatively recent origin, almost unknown a few years ago, and but within two years recognized as being a serious menace to the pickle grower.

Mr. WILSON. Have you traced the source of the disease?

Dr. ORTON. We have not yet traced the source of the disease, but we have discovered its relationship to other mosaic diseases which have appeared in several crops in recent years—one of the tomato, one of the potato, and one of the tobacco. These are all serious diseases and the facts already known about them are now applicable to cucumbers. These mosaic troubles have many of the characteristics of the germ diseases, but we can find no organism. The cause is what we call a filterable virus; I mean that the agent of infection is so small that it will pass through a porcelain filter and still retain its ability to reproduce the disease when injected into a healthy plant. The chief of inoculation is played by insects, which feed upon a diseased plant in the field and pass then to the neighboring vines and carry with them this virus or infection which they inject into the leaves. In that way the disease may spread rapidly through a field.

The CHAIRMAN. That gives the committee some idea of the danger and importance of this disease. What remedies have you so far discovered for it?

Dr. ORTON. The indications are that the remedy will consist, first, in the control and destruction of the insects and, secondly, in the application of sanitary measures to eliminate the sources of infection.

We propose to carry out next year a demonstration of this plan by taking a farm or community and inspecting all of the pickle fields, to remove all of the diseased plants and hold-over cases, so that there will be as few as possible sources of infection. We are asking the Bureau of Entomology to apply their expert skill to the control of the insects.

The CHAIRMAN. Have you undertaken to breed resistant plants?

Dr. ORTON. We have made a number of attempts, but within the standard pickling types of cucumbers we have as yet found no material resistance.

The CHAIRMAN. Is it your belief that you can finally control and probably eradicate these diseases?

Dr. ORTON. I feel very hopeful about this mosaic disease and the bacterial wilt, which are the two spread by insects. If our entomologists can control the spread of the insects, the pathologists will do the rest toward getting rid of the diseases.

Some of the other troubles we are thus far a little less confident about, but there is every reason to think it will be possible to avoid the greater part of the losses to which the pickle industry is now subjected.

I have mentioned the mosaic disease as one of those spread by insects. Another is the bacterial wilt. This disease is caused by a species of bacteria which inhabits the stems and roots of the plants:

these bacteria fill up the water ducts of the cucumber and the plant suddenly wilts and dies. Bacterial wilt is spread primarily by the striped cucumber beetle and, in addition to that, the germ lives over the winter in the bodies of the beetle during hibernation. So it is apparent that we have a weak point in the life history of this disease which offers a means of attack and great promise of control.

The CHAIRMAN. Is there anything further?

Dr. ORTON. Not unless you care to go into the details regarding some of the other troubles.

The CHAIRMAN. We will confine our discussion to this one particular problem this morning. If there are no further questions, we are very much obliged to you, Dr. Orton.

Mr. Taylor, do you care to have Mr. Gilbert say anything?

Mr. TAYLOR: I think the matter has been fully presented, Mr. Chairman, in so far as its relations to the project in hand is concerned.

The CHAIRMAN. Very good, sir. Dr. Howard, will you give us your views upon this proposition and what you hope to be able to do if you get an additional appropriation of $5,000.

STATEMENT OF DR. L. O. HOWARD, CHIEF OF THE BUREAU OF ENTOMOLOGY.

Dr. HOWARD. Mr. Chairman, your committee gives us a matter of $37,500 for the study of insects injurious to truck crops. The estimates for the Bureau of Entomology are found on page 137, item 38 for investigations of insects affecting truck crops, $37,760. Of that amount, we have spent only $2,600 for the investigation of insects affecting cucurbits—that is to say, cucumbers, melons, squashes, and truck crops of that class. The reason we have not spent any more on that class of crops is that it was thought that the damage to the plants was done by the insects themselves, and it has not seemed to be of sufficient comparative value to warrant a larger expense. But the discovery that these insects are agents for the carriage of these two very injurious forms of diseases makes it necessary to spend more money on that class of insects.

There are three important species of insects—the striped cucumber beetle, the melon aphis—which also attacks the cucumber—and the tarnished plant bug. All of those insects will feed on cucumbers, and the melon aphis and tarnished plant bug also feed on other plants; and all are instrumental in the carriage of those diseases. We know their life histories rather well and know about how they breed and when they appear in greatest numbers in the field. From our knowledge of the life history of each species, we have an advantage and may be able to develop some better means of attack. Even in small numbers they are still capable of spreading the diseases and this makes it necessary to devise more perfect means of control.

For example, we know that one of those diseases—the bacterial wilt—is carried over from one season to another, and we know in a general way that the striped cucumber beetles hibernate under trash around fields. We know too that when the spring comes and the plants begin to come up the insects feed on the plant, and thus begin the spread of the disease. They lay eggs on the roots of the plants, which usually results in the death of the plants. There may be a means of attracting the beetles in the early spring to other cucurbits—

[illegible] plants—before the cucumbers [illegible] with arsenate of lead, and this must [illegible] beetles come along. That is the [illegible]

[illegible] autumn, after the cucumbers [illegible] will congregate on other plants, will [illegible] a lot of experimental work will [illegible] to be of considerable value.

Mr. [illegible] Paris green any more?

[illegible] be bought just now in the way [illegible] account of the war conditions, and we are [illegible] of lead. Arsenate of lead is a little better [illegible] used liberally without danger of [illegible]

We [illegible] present conditions, which, without [illegible] would have to be detailed to this work; and, if you [illegible] appropriation of $5,000, which seems justified [illegible] fact that this disease is carried by [illegible] one or two more men in the field and [illegible] to carry on the work there.

The CHAIRMAN. This discovery was made, doctor, since this estimate was [illegible]

Mr. [illegible] was called to my attention after the estimates were made [illegible] last summer.

Mr. [illegible] was essential to this season's work.

The CHAIRMAN. We are very much obliged to you. Mr. McLaughlin, [illegible] you have on this proposition?

Mr. [illegible] I do not think there is anything else.

Mr. [illegible] statistics I gave you, we would like to have the committee [illegible] that we did not consider the acreage planted with cucumbers for slicing—that is, growing cucumbers for the market—[illegible] a great many cucumber growers in the United States, especially in the Southern States, who produce a great many cucumbers for slicing purposes and for shipping north and east. Of course, these diseases and bugs attack them the same as they do with us, and that makes our problems all the more important.

The CHAIRMAN. We are very much obliged to you.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Wednesday, February 2, 1916.

(The following statement by Congressman Raker was made during the forenoon session of the committee on February 2, but is inserted at this place in the hearings as the subject matter has reference to the work of the Bureau of Biological Survey:)

STATEMENT OF HON. JOHN E. RAKER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA.

The CHAIRMAN. Judge Raker is here, and he has a bill which he desires to discuss before the committee for a few minutes.

Mr. RAKER. This is a bill making an appropriation for a sufficient amount of money to go into the general appropriation bill for the purpose of being used on the national forest and public domain for the destruction of coyotes, squirrels, and other animals injurious to agriculture and the animal industry.

Coming directly from the territory that is affected by rabies among the coyotes, I can speak with personal knowledge upon most of what I have to say. For the last four months the infected coyotes have been prevalent in northern California, northern and western Nevada, and southern Oregon, and have extended now over into Utah and Idaho, and over the greater part of Nevada, and to such a degree that it is alarming. It not only affects the interests of the stock people, but it is very dangerous to human life. A number of people have been bitten by rabid coyotes, as well as by dogs, the dogs having been infected with rabies from the coyotes. Every effort is being made by the local and the State authorities to stay and eradicate this disease.

The coyotes seem to be more prevalent this year—from 40 years' experience, so far as I am personally concerned—than ever before. Our boards of supervisors have offered a reward or bounty, and the various counties of California also, and some go as high as $15. Oregon, as Mr. Hawley knows, is paying a bounty, and over in Nevada they are doing the same. And I spent at least three weeks, before I came on in November, going through some of those various counties which are assisting with the work in eradicating this disease. The State boards of health are also cooperating, and the States are getting active in the matter.

There has been an emergency appropriation of $75,000 placed upon the urgent deficiency bill by the Senate, and I know it will go through. The question now is to get a sufficient amount of money that will eradicate the coyotes.

... I know what the necessity of this I want to tell you what the ... instance in my home county ... were ... exterminated under the State law. The ... dog in a pasture or to get a small ... Every cat and dog found at large will ... destroyed, and we have killed numbers of ... cats because they are as dangerous ... dogs are. The owners will not ... We have had ... sparing our homes and ...

... to Washington. I started ... I knew well, was ... take the Pasteur treatment and ... given him.

... coyote?

... dog which, about two weeks before ... came into the center of the town ... dogs and chickens and jumping ... cattle and other animals. It went ... finally, when it got on the ... and killed it and sent its head ... examination, it was found to have ...

... that the habits and disposition ... affected with the rabies?

... stops for nothing. He will start right ... sight. He will jump in the corral ... Mr. Sells was telling me this: I do not know it ... Mr. Sells ... with the Biological Survey—he ... $80 to $90 apiece, and every one of them ... dead. He goes into a corral and keeps right on biting and then ... every dog, human being, and every ... sight and he never stops. They stop for nothing.

Mr. HUMPHREY. He loses all fear of human beings?

Mr. KNOWLES. He will run right along by the side of an automobile ... up alongside of it and 10 chances to 1 he will jump right ... at it and the next dog will do the same; and there are so many ... that we have no means of controlling them. To cite from ... own personal experience. One evening I had to walk about 3 ... through the country and I never felt so helpless in my life and ... felt that there was so much danger surrounding me as I did ... because I knew the coyotes were in that community, as several ... been killed in the locality, and they had also bitten the dogs. ... do not need to be bitten; a mere scratch is sufficient to produce ... There are chances now of effecting a cure, but it is not ... successful.

I ... a few days before I left home that over in an adjoining ... coyote had come to town and bitten several cows and a lot ... It went into the store and the door being open, went ... the store and ... through the store to the back yard, and ... through where they killed him in the back yard.

Now, ... way that we can ... the only relief we have or will ... will be ... effective ... the part of the Government, in coop-

eration with the State and local authorities, to exterminate those coyotes as near as the thing can possibly be done.

In Bly, coyotes got in the corrals—I notice by the last report from there last week—and there have been a number of cattle bitten through there; and once rabies gets into the cattle, it is a question whether the dogs and chickens eating an animal that has been thus infected will not become infected also by virtue of eating the diseased meat.

I think it is a question now whether or not they are going to have a quarantine of our beef cattle and other cattle, because they seem to get in one with the other in some way. It is a very, very dangerous condition.

Mr. HELGESEN. Is there any way of that being controlled except by a total extermination of the coyote?

Mr. RAKER. That is practically the only way. The secretary of the State board of health was here last week, and, from information I can get from the Biological Survey, as well as from the health department and those at home, there seems to be no possible way of stopping it except by a complete extermination.

Mr. HELGESEN. I mean an extermination of all the coyotes—well and sick; you will have to exterminate them all?

Mr. RAKER. Yes; exterminate them all.

Mr. WILSON. How are you going to do it?

Mr. RAKER. By killing them.

Mr. WILSON. I know, but they are pretty foxy animals.

Mr. RAKER. Yes; but with our quarantine and with the destruction of the dogs we feel that we will have eliminated that danger; and we are destroying the coyotes. The hunters are getting $2.50 a head from the county for killing each coyote, and they can get from $2.50 to $4 for the fur. This is an inducement and will help to exterminate them very rapidly.

Now, the Government has some 25 men in my county who are paid a salary for hunting coyotes. They are paid according to the number they destroy. The stockmen are just as much interested in this and are spending their individual money for hunters to assist in the complete extermination of those animals, and that is the only way we can do it.

Mr. HELGESEN. In our State I have obtained a statement showing that we have spent vastly more money than you are asking for here, just for that one State, and apparently the coyotes are just as thick as ever.

Mr. WILSON. That is what I think; I do not know how you are ever going to exterminate them. I know something about the hunting of them.

Mr. RAKER. You can catch them all right, and with the efforts in Utah, Idaho, Oregon, California, and a certain portion of Colorado, we have that territory thoroughly hunted over with the local authorities. The stockmen are interested there now because of the damage to their herds. They are going to spend their money and are doing it and with the Government's assistance it gives an opportunity to exterminate them as nearly as can be done.

Mr. STEELE. I move that the appropriation be allowed.

Mr. RAKER. I have a lot of matters here that I wanted to have inserted in the record, but there is no need of incumbering the record

STATEMENT OF MR. E. W. NELSON, ASSISTANT CHIEF OF THE BUREAU OF BIOLOGICAL SURVEY

[illegible] Mr. Nelson, will [illegible] seems to be [illegible] administrative [illegible] that case [illegible]

[illegible] the question being repeated. [illegible] these charges to the statutory roll. [illegible] increase has been made in the fund [illegible] transfer was made.

The CHAIRMAN. And each individual was transferred at the same salary?

Mr. NELSON. At the same salary.

The CHAIRMAN. In all cases?

Mr. NELSON. In all cases.

Mr. HAWLEY. Do you remember how many of those transferred from the lump sum to the statutory roll were newly put on the lump-fund pay roll this year?

Mr. NELSON. I think practically all of them since January, 1915. The appropriation was increased, you will remember, during this past year, and it required considerable extension of our office force. Our business has increased 150 per cent, owing to increased appropriations.

Mr. ANDERSON. Since when?

Mr. NELSON. Since a year ago last July, when increased appropriations were made for the predatory-animal and other work. For this year—1916—Congress gave us $280,000 under the food-habits item, and that also required an increase in our office force to handle the resulting increase in business.

Mr. HELGESEN. For what was it given?

Mr. NELSON. For investigating the food habits of native birds and mammals. That item covers new work for control of predatory animals; and it continues the investigations of the economic relations of birds, the investigation and control of noxious rodents, experiments in fur farming, and investigation of the duck disease in Salt Lake Valley.

Mr. ANDERSON. I am somewhat interested in the traveling expenses in the bureau. I have made a tabulation of the increase based on the amount that was spent in 1915 and the amount estimated in this bill. According to my figures, in your bureau there is an increase over 1915 of over 84 per cent. I would like to know what additional changes here have been in the work of the bureau which justify an increase of that size.

Mr. NELSON. An increase for the fiscal year 1916 of $165,000 was appropriated to control predatory and other noxious animals, which is almost entirely spent for the employment of men to carry on work in the field. This means that a large part of the money must necessarily go to traveling expenses. The men work over widely scattered areas, under field inspectors, each inspector being in charge of several field parties. The expenditure of this $165,000 is practically all for field work; comparatively little of it is spent in the office. This field work extends throughout the West, and of course that means rather expensive travel owing to the high cost of teams and other travel items.

Mr. ANDERSON. What has been the total amount in the increase for your bureau since 1915?

Mr. NELSON. There was an increase of $165,000 for the fiscal year 1916.

Mr. ANDERSON. That was an increase?

Mr. NELSON. Yes.

Mr. ANDERSON. The total increase over 1915 appears to be about $210,000 or $215,000, according to my figures.

The CHAIRMAN. I have it before me, $281,290 for the entire bureau for 1915, and $446,290 for the fiscal year 1916, showing an increase of $165,000.

Mr. ANDERSON. Of that amount, according to my figures, $33,000 is an additional expenditure for traveling.

Mr. NELSON. That means maintaining field parties; since nearly all of that increase goes to field work, that necessarily implies traveling expenses. Mr. Chairman, if satisfactory to the committee, further details on this subject can be given later when that branch of the work is considered.

The CHAIRMAN. Very well. I leave that to Mr. Anderson.

Mr. ANDERSON. That is satisfactory to me.

The CHAIRMAN. I don't think it is necessary to go over these items one by one except item 11. Mr. Nelson explains that these are all transfers from the lump fund, the lump fund being reduced by that amount, and that the transfers have been made at the same salary.

[illegible] designation of a person who [illegible] to the title of clerk.

Mr. NORTON. Mr. Chairman, it has been decided to [illegible] and leave it as it stands in the [illegible]

The CHAIRMAN. That will raise you two clerks at $900?

Mr. NORTON. Yes; two clerks at $900 and one draftsman.

Mr. HAUGEN. The draftsman will come between items 18 and 19.

The CHAIRMAN. Just where is it now.

Now, Mr. Norton, if there are no further questions on the statement of the appropriation for general expenses item on page 147, first for [illegible] and 244 of the act approved May [illegible] for other purposes, $14,640. Give us briefly what is [illegible] that item.

Mr. NORTON. Mr. Chairman, Dr. Palmer has had charge of that work, and I would suggest that he present the facts to the committee.

STATEMENT OF DR. T. S. PALMER, IN CHARGE OF GAME PRESERVATION, BUREAU OF BIOLOGICAL SURVEY.

Dr. PALMER. Mr. Chairman, this paragraph 24, involves no essential [illegible] for last year. The apparent decrease of $[illegible] is due to the transfer to the statutory roll of a clerk who was [illegible] last year.

The work is on the same basis as last year, and involves three distinct lines under a heading which is somewhat ambiguous to those who are not familiar with the law. These three lines include regulation of importation of foreign birds, interstate traffic in game, and collection of information on game protection—all under the Lacey Act. Section 242 of the act of March 4, 1909—formerly section 2 of the Lacey Act—provides for regulating the importation of birds and animals from foreign countries to prevent the introduction of pests which might be brought from abroad. This entire work is maintained, aside from overhead charges, at a cost of less than $2,000 a year for actual inspection at the larger ports. The importations made during the past year have naturally fallen off on account of unsettled conditions abroad. Ordinarily we import on an average upward of [illegible] wild birds a day every day of the year. Our importations had nearly reached the half-million mark before the war came on, but for the last fiscal year they were only a little over 300,000.

Mr. HAUGEN. For what do you get them?

Dr. PALMER. For breeding, exhibition, and scientific purposes. A great many of the birds are song birds, most of which come from Europe. There are a great many game birds, particularly from Europe, some from Asia, and some from Mexico, and there are also animals and birds imported for zoological gardens and parks, and for propagating purposes.

The CHAIRMAN. Section 242—what is that?

Dr. PALMER. Just a moment. I would like to call attention to [illegible] matters in which the committee might be interested in connection with the work under section 242. We have for 15 years successfully kept out the mongoose, one of the worst animal pests that could be brought into this country. Last year two specimens inadvertently gained entrance, but they were reshipped or destroyed.

nd so far as known there is not a specimen of the mongoose now at arge within our borders except in Hawaii and in Port Rico. The roblem is to keep this species from gaining a foothold in the conti-ental United States.

Mr. HELGESEN. What is the danger?

Dr. PALMER. The loss would amount to millions if the mongoose nce got a foothold. It destroys every sort of terrestrial life—birds, mall animals, and poultry, with a consequent increase in insect ests and other damages.

Mr. HAWLEY. Is it a climbing animal?

Dr. PALMER. It won't climb very high.

Our supply of quail for breeding purposes in recent years has come om Mexico, and the birds are often infected with quail disease. hen this disease manifests itself, our custom has been to suspend rther importations. Last winter, after importing about 3,000 uail from northeastern Mexico, the disease suddenly appeared and rther importations were suspended on January 6, 1915. We fterwards found that one-third of the birds brought in subsequently ed from the disease. We are still continuing close scrutiny of the irds imported from Mexico. This winter some 8,000 birds have en imported, but as the disease has again appeared entries were spended on January 20.

Mr. CANDLER. What is the character of that disease?

Dr. PALMER. It is an intestinal disease, easily recognized by the resence of small white lines and spots on the liver and intestines. t spreads like wildfire through a flock, and usually in 10 days all the fected birds are dead. There is no known cure for it.

Mr. HELGESEN. Is the importation of quail of sufficient importance o take chances of that kind?

Dr. PALMER. We think no chances should be taken.

Mr. HELGESEN. I mean should we not prohibit them entirely?

Dr. PALMER. The difficulty is that northeastern Mexico at present s the only place where quail can be obtained and sportsmen are nxious to restock their fields and covers. Quarantine is now made ore stringent and we hope to check the spread of the disease.

Mr. HELGESEN. If we bring that disease in and destroy what quail e have got, there would be no improvement.

Dr. PALMER. No.

The CHAIRMAN. Any further discussion of 241? Pass on, then, to he next item, which covers sections 242, 243, and 244, regulating the terstate shipments of game.

Dr. PALMER. In connection with this work, the department is equired to prevent, so far as it can, the shipment of birds or game r furs or skins of animals and birds which may have been killed in iolation of local laws and shipped contrary to local or Federal laws nto some other part of the country. This work has undergone con-iderable change in recent years, and, while there has been no increase n the force or in the appropriation, the difficulties of enforcing the aw have increased very considerably, due to several factors, and specially to the introduction of the automobile and the parcel post. 'he provision in the penal code regulating shipment of game pro-ibits merely delivery to a common carrier. Consequently, we are ithout authority to act in cases of shipments which are carried cross State lines by automobiles or by mail. Shippers discovering

that fact have been quick to take advantage of [illegible] quarantine regulations now transported [illegible] would be worth while to attack in such cases. The [illegible] has been rather limited, and as we [illegible] the work we have taken it up in [illegible] our attention primarily to [illegible] Mississippi Valley and the West. For some years [illegible] the illegal shipment of wild ducks from the Mississippi Valley in Arkansas [illegible] and Louisiana.

Most of these ducks are dead birds, of course? [illegible] birds for market purposes. Formerly, the [illegible] circumstances, due to a change in the law [illegible] Supreme Court of Arkansas and new [illegible] confused with our own work. I am happy [illegible] we have succeeded in checking these shipments [illegible] breeding grounds in that section. I say this [illegible] reports show that shipments [illegible] the last few weeks, were we to withdraw [illegible] they would be resumed in a short time.

We [illegible] investigation of shipments from Pacific [illegible] and San Francisco—and from [illegible] working back from Chicago, the point [illegible] shipment.

Most [illegible] the States have laws preventing [illegible] any sort of law preventing export [illegible].

Many [illegible] have laws preventing men from [illegible] and in their possession, they are [illegible] though they were shippers?

[illegible]

We [illegible] would be almost sufficient [illegible] for the fact that it is very [illegible] any State to discover the [illegible] Take a small State like Delaware [illegible] in Wilmington and in [illegible] Pennsylvania.

We [illegible] States have laws they will prevent [illegible]. As a matter of fact [illegible] except in case of a long [illegible] We [illegible] certain shipments of water-fowl [illegible] points and some of this [illegible] shippers began several [illegible] A great many [illegible] were gathered up which [illegible] in the market gunners [illegible] ducks were consigned [illegible] to Denver [illegible] We have got the test [illegible] cases now pending in the [illegible] that all [illegible] from Salt Lake and [illegible] stopped at least for a time.

are handicapped, Mr. Chairman, in this work by a point which
ht mention here, or I will speak of it later. An inspector work-
ıder this paragraph, section 242, will often discover a violation
migratory-bird law or the bird-reservation law. As he is not
rom that appropriation, he must either call for assistance from
igratory-bird inspector or he must report the case to Washing-
ıd have have his authorization changed or have the case referred
to the proper man. Similarly, a man working under this para-
in the sunken lands of Arkansas near the Federal bird reserva-
vhich has recently been established finds a man shooting in vio-
of the Federal law protecting bird reservations, section 84 of the
Code. But as the enforcement of the latter law is the duty of
spector appointed under paragraph 25, he is not authorized to
expenses to enforce that law. The result has been that during
ast year there has been an unfortunate increase in the expense
ing some of our field work, for in many places our men have
t been compelled to travel two by two in order to accomplish
that one could do if he were authorized to act under the reserva-
aw and tne migratory-bird act.

RUBEY. What is to prevent employing him under both acts?

PALMER. Nothing, except that in the way the appropriation is
d it is necessary to segregate the expenses under each item car-
n the appropriation. In order to do that, the man must be
erred from one roll to the other, or his expenses must be carried
and forth.

RUBEY. Can't you adjust that by a simple method of book-
ng? Where one man working under one section goes out and
a violation under another, can't he go ahead and correct that
ion and prosecute the person who is violating that act and
t back to you the expense that he has incurred in that particular
and can't that be charged up to the appropriation covering
ase?

PALMER. You must secure an authorization first, and the
has been that men have seen violations which they could not

EMENT OF MR. E. W. NELSON, ASSISTANT CHIEF OF THE BUREAU OF BIOLOGICAL SURVEY—Continued.

CHAIRMAN. Have you any suggestion for curing that defect?

NELSON. The practice for enforcement of laws under two
priation items is to instruct a man employed under one item to
ıat he can for the other without incurring expenses outside his
te line of service. For instance, the migratory-bird man is
cted to do what he can for the Lacey Act work without seriously
ering with his own work. In many cases we thus get cooperation
ut the necessity of transferring a man from one fund to another;
hen this transfer is necessary a special authorization is issued
man to do the special job. If a man should be sent out to do
kinds of work, it would be almost impossible to accurately
ate his expenses under the two appropriations.

CHAIRMAN. What are you going to do about it? What do
ggest as a cure for this?

Mr. NELSON. I beg your pardon in the expenses—that man's salary and expenses while he is in the field are paid out of the appropriation with which he is detailed and there is no crossing of funds.

Mr. ANDERSON. That is true, but from the standpoint of a man who does not understand a good deal of this at one time it is exactly the same.

Mr. NELSON. The effect on the fact is the same as though a man from outside the service had been employed to do the work. The expenses to cover the special job always appear against the appropriation to which the work belongs.

Mr. ANDERSON. All of that, of course, is true, but I say from the standpoint of the Member of Congress it does not affect the general situation because we can not take up each one of these appropriations to see whether men who are paid out of one appropriation are detailed to another branch of work and paid out of another appropriation. Our assumption has commonly got to be that all the expenses incurred under one appropriation are paid out of that appropriation.

Mr. NELSON. Your assumption agrees with the facts. The personality of the man who does the work cuts no figure in this at all. It is the doing of the work that is considered, and the salary and expenses of the man detailed are temporarily paid out of the fund to which the work properly belongs.

The CHAIRMAN. The ideal in this situation is that the Committee on Expenditures of the Agricultural Department should be thoroughly alive to its responsibilities—and I am not criticizing that committee—by making a real investigation into the activities of the department and the expenditure of the money under these various items and report it to this committee or report it to the House, making it available to this committee before we make up this bill. That is the ideal. But I don't suppose it will be reached. Mr.

on's suggestion has a good deal of force. Money should not merely because it is unnecessary to check up these details.
NELSON. We are held to a strict accountability by the dis- officer, and if any expenditure is made illegally we also hear from the auditor or comptroller.
HELGESEN. But if these two problems can be combined, let suggestions as to how to combine them.
CHAIRMAN. The matter could be solved by combining items 24 . But the policy of this committee and the policy of the with regard to this bill has been to segregate the various lines as far as possible.
HAWLEY. Would that suggestion accomplish it? These are of the Revised Statutes.
CHAIRMAN. I may be mistaken as to that. That proposition be a combination of these two items.
HAWLEY. They are under two different sections of the Revised s.
CHAIRMAN. That would make some difference, but what I had I was that the committee, in following the will of Congress, has o far in the direction of making a lot of unnecessary book- . Whether that is offset by other advantages I do not know. nclined to think it is not.
ANDERSON. I would like to ask one more question. Would it ible to effect any economy if all the amounts estimated for these various items for traveling expenses were segregated a single item?
NELSON. I do not think it would result in a dollar's economy. ot see how it would affect the result in any way, except to e cost by extra bookkeeping. In the first place, in all esti- we have to get at the approximate amount that is to be spent vel. If the estimates for travel under all items should be riated separately, serious interference with the work might

ANDERSON. And you always get the estimate large enough?
NELSON. The estimate for travel is mainly taken for field work. propriate money for us to do certain work. Now, in order to work we must travel, and it is necessary to make our esti- for traveling expenses large enough to cover that part of the If we exhaust our available funds for travel we can not get nd field work stops.
ANDERSON. That is the exact point I am trying to get at. The f appropriating for traveling expenses under each item is that y instance you ask for more money than you actually need.
NELSON. I beg your pardon. In no case do we have sufficient or the work that needs to be done, and in some of the items is woefully short. For instance, in game preservation, under ey Act, it is very short.
ANDERSON. With the system I am talking about, if your was short on one item and long on another you could use the from one item on the other. In other words, you could use g expenses where you need it instead of having to use it for articular item.
NELSON. But where we have, as in the predatory-animal work, 25,000 appropriated, and we estimate that we shall spend so

mmals."
NDERSON. I find the item, but I do not find the estimate.
[ELSON. That is down near the bottom of the paragraph on
0.
[ELGESEN. Isn't this the same kind of work that Congressman
old about this morning?
[ELSON. Yes, sir.
NDERSON. That is all right.

MENT OF DR. T. S. PALMER, IN CHARGE OF GAME SERVATION, BUREAU OF BIOLOGICAL SURVEY—Contd.

ALMER. I merely suggested that the practical difficulty in ion with traveling expenses in game preservation work arises e fact that the committee about 1910 subdivided our appro-. I am in sympathy with the desire to determine the cost of e of work, but it so happens that game-preservation work is se, and our appropriation, already small, is cut into two or parate items, and the result has been embarrassing at times. the past year in some cases some of the men had to double up. on the difficulty because I think the committee should under-hat has been our actual experience and one reason why we are licapped in carrying out the work with no increase in the iation and an actual increase in the work itself and in the of conducting it.
HAIRMAN. Now, can you make a suggestion as to how this tee can help you out of your difficulty?
ALMER. Mr. Chairman, I can only suggest the matter tenta- If the items under paragraphs 24 and 25 could be combined ppropriation, with a proviso that the amounts expended for rticular kind of work shall be reported to Congress by projects ned in the department's Program of Work, it seems to me would relieve our difficulty. The expenses now carried on

Mr. HAWLEY. The law of Virginia is violated?

Dr. PALMER. The law of Virginia is violated, but we are not al
to take action because the game is not brought into the Distri
with certain restrictions and Congress has made an open season i
District extending up to the 15th of March.

Mr. HAWLEY. What should be the last day?

Dr. PALMER. The season in the District should not be later tha
in the adjoining States. It closes on Christmas Day in Mary
on the 1st day of January in Virginia west of the Blue Ridge, a
the 1st day of February in the eastern part of Virginia, and y
allow the sale of birds stolen from adjoining States from six we
two and one half months later.

Mr. HAWLEY. Then if the closed season were made January
would obviate the difficulty?

Dr. PALMER. In part. Washington is one of the few large
where quail can be sold at all, in most States the sale of these
is entirely prohibited.

The CHAIRMAN. That is interesting, but that is under the ju
from of another committee.

Dr. PALMER. Except that it shows the difficulty of preventi
illegal shipment of quail into the District under section 242 o
Penal Code.

ELE. Did the department ever bring that to the attention of
kers and frame a bill? Did you ever suggest that to them?
MER. We have, but we have never been able to cure the
the District law. The time has come when the Lacey Act
d be amended to meet new conditions, brought about by
tion of game by private boats, automobiles, by parcel post,
th.
AIRMAN. Take up paragraph 25.
MER. Under item 25, we are compelled to maintain as far
with an appropriation of $21,000 some 68 national bird
ns, scattered from Porto Rico to Alaska; to maintain the
National Bison Range, with a herd of 140 buffalo; an elk
Wyoming, on which the Government has expended $50,000;
e refuge in Nebraska comprising about 14,000 acres, and a
game preserve on the Wind Cave National Park in South
ocked with a herd of buffalo and elk, and some antelope.
AIRMAN. How many were there in that herd?
MER. Fourteen buffalo, 14 elk, and a few antelope.
DLER. Are the buffalo increasing?
MER. Buffalo in general have nearly trebled in the last 15
s. There are now in round numbers some 4,000 head of
compared with about 2,000 in 1908, of which the United
vernment owns about 12 per cent, the Canadian Govern-
nt 50 per cent, and private individuals the remainder.
belonging to the United States are now in six different
e under the jurisdiction of the Smithsonian Institution,
the Department of the Interior, and four under the De
of Agriculture, of which three are in charge of the Bio
vey and one in charge of the Forest Service.
. How many buffalo are there in the United States?
MER. In Government and private herds together, roughly,
less than 2,000.
IRMAN. Four thousand?
MER. Four thousand, all told, including those in Canada.
LLY. For what do private parties own them?
MER. For breeding, experimental purposes, and exhibition.
ree experiments have been made in crossing buffalo with

LLY. Is the Government carrying on any experiments of

MER. The Government of the United States is not.
DLER. Is the herd belonging to this Government increasing?
MER. We have 490 head, including 90 calves born last
l years ago we had less than 60. The Montana range,
ted with 37 head in 1909, now has 142. The Wichita herd
1906 with 15 and now numbers 62.
TLEY. How many animals can that Montana range support?
MER. It is a little difficult to say how many it can support,
ie conditions could be materially improved. If it were
the range could probably support between 600 and 700

TLEY. Do you have to feed them?

[illegible] Montana range [illegible] on the Niobrara [illegible] where we have a small inclosure containing [illegible] and [illegible] through the winter. The fact [illegible] the range and during [illegible] but this is not an [illegible] We [illegible] more of the range so that the [illegible]

[illegible] that belongs to the [illegible]

[illegible] The grass is growing abundantly [illegible] at present the increase from the fact [illegible] and ruin the fences and buildings. [illegible] shown by experience on the bison range. [illegible] we have a fire and it was only by great [illegible] suffer from the fire.

Mr. HAUGEN. What is the object of dividing them up into so [illegible]

[illegible] buffalo were in one herd we might lose them all [illegible] buffalo have suffered at three different [illegible] When we took the herd to Oklahoma [illegible] can not be maintained on account of the [illegible] We actually lost 2 head the first year [illegible] and the herd has since been [illegible] In the Yellowstone Park herd an epidemic of [illegible] in December, 1911, and [illegible] In the case of the National Zoological Park herd [illegible] more than half of the herd died [illegible] years ago. In my judgment, we should [illegible] buffalo herds widely separated and have [illegible] buffalo to insure against possible losses.

The CHAIRMAN. What are you doing with your bird reservations?

Dr. PALMER. There have been several new bird reservations established [illegible] to date there have been [illegible] those we had to abandon because of lack of funds to maintain it and another one is under the jurisdiction of the Bureau of Fisheries having [illegible] charge of the Biological Survey.

Mr. HAUGEN. Where is the one that you abandoned?

Dr. PALMER. On Blackbeard Island on the coast of Georgia.

Mr. HAUGEN. Is it within the discretion of the bureau to establish these bird reservations?

Dr. PALMER. They are established by Executive order on recommendation of the Secretary of the Interior.

The CHAIRMAN. Does the Government own the island?

Dr. PALMER. Yes, sir; it belongs to the Government. It was maintained for a number of years as a quarantine station by the Treasury Department.

The CHAIRMAN. Do I understand you to say it was used as a bird reservation?

Dr. PALMER. Yes; it was established July 7, 1914, but when we found it was impossible to maintain it with the present appropriation we recommended that the reservation be abandoned as a bird refuge.

Mr. CHANDLER. Who has control of it?

Dr. PALMER. The Treasury Department has leased it to the State of Georgia.

The CHAIRMAN. You don't make any recommendation for an increased appropriation for that?

Dr. PALMER. No, sir; the estimates include no increased appropriation this year. We are doing the best we can with the funds available, but we are not in a position to protect the reservation adequately. We have had a fire on the bison range in Montana, a fire on the Klamath Reservation in Oregon, and a poaching expedition on the Hawaiian Reservation in the Pacific during the past year.

Mr. HAWLEY. What were the poachers after?

Dr. PALMER. They were primarily after plume birds. It is a very dangerous situation to leave the islands in the Hawaiian reservation unguarded, because they may at any time become the base for smuggling or foreign poaching expeditions. There are dangerous reefs near some of the islands, and there has been one wreck near Laysan Island this year. It was only by the greatest luck that the crew of an American schooner was not lost on the island. The schooner went ashore on Maro reef, near Laysan, where there happened to be a small yacht, with which the crew reached the cable station on Midway Island, and from that point they reached Honolulu with the assistance of the Navy Department. We are absolutely helpless to maintain supervision over the Hawaiian reservation, except through the cooperation of the Coast Guard. Some 300,000 birds were killed by a poaching expedition last spring.

The CHAIRMAN. You did not tell us about your elk.

Dr. PALMER. Just one moment before I leave the bird reserves.

Mr. HAWLEY. Did the poachers leave many birds?

Dr. PALMER. They left a few. This was the third poaching expedition that has occurred in the last 10 or 15 years, and I think 800,000 or possibly 1,000,000 birds have been killed.

Mr. HOWELL. Did you discover who the poachers were?

Dr. PALMER. No, except that there were two graves on the island.

Mr. HAWLEY. You didn't have anything to do with the making of those graves?

Dr. PALMER. No, sir. One other point I would like to call attention to. Many of these bird reserves are coastal islands, and we are supposed to patrol these reserves with one motor boat. The restriction in the use of motor boats has been such that we own only one motor boat, and yet we are supposed to patrol a number of widely scattered islands. In Arkansas, where we have a big reserve, we have not attempted warden service, because we have no motor boat. With the flooded conditions there at present, it would be impossible to do anything without a motor boat, and yet with the allotment we are unable to get such a boat.

Mr. ANDERSON. Do you think it would be desirable to cut off $8,000 from the migratory-bird provision and put it there?

Dr. PALMER. No, sir; but if we had a little leeway in this matter I think the difficulty could be readily relieved.

The CHAIRMAN. You know the motor-boat proposition is not the child of this committee. It is the child of another committee.

Dr. PALMER. If we had another boat or two it would help us a great deal. I noticed on Yellowstone Lake that there were several motor boats for use in taking fish and fish spawn, yet we have only one for a number of reservations.

[illegible]

[illegible] are confined to waters of [illegible]

[illegible] two species of prairie [illegible] local upland game [illegible] State reserves?

[illegible] number of them. [illegible] Superior Game Preserve [illegible] established at Lake [illegible]

[illegible] a word about your elk.

[illegible] Mr. Chairman, you will [illegible] of which sum $2.5[illegible] and transportation of [illegible] leaves the amount for work of [illegible] $18,500. Whatever part of this $2[illegible] to transfer elk and other large game animals [illegible] year, the Biological Survey transferred [illegible] from the Yellowstone National Park to the [illegible] Colorado 25 head to Utah and 50 to reservations in Colorado.

Mr. ANDERSON. What is the relation between the work you have [illegible] and the work under the migratory-bird act?

Dr. PALMER. The reservation work and the work in regulating interstate commerce in game are under two separate laws. The reservation work relates to the maintenance and propagation of birds and mammals confined to definite areas controlled by the Government; that regulating interstate shipments of game relates to all the States. The same is true of the work under the migratory-bird law, which comes a little later on.

Mr. ANDERSON. The migratory-bird work has no direct connection with the reservations on Government lands?

Dr. PALMER. Only when the birds on the reservations are migratory game or insectivorous birds.

Mr. ANDERSON. The point I am trying to get at is whether it is not possible to connect up the three lines of work, which are in a general way tending in the same direction, so as to accomplish a higher degree of efficiency; in other words, to get more for your money?

Dr. PALMER. If any officer of the Biological Survey who is appointed to do warden work were authorized by a proviso in the bill to aid in [illegible] enforcement of any Federal game laws, under the jurisdiction of [illegible] could do it without being transferred from one roll to [illegible] amount of his expenses could be carried on the books

n the office and a report made to Congress. How far it is desirable o divide up the items in the appropriation, I can not say.

Mr. LEE. Would elk thrive in the Appalachian Mountains?

Dr. PALMER. Yes, sir; elk have already been transferred to Pennylvania, West Virginia, and Virginia. I understand that the State f Alabama has also arranged for a carload of elk for some point in orthern Alabama. We hope to have them in every one of the States n which purchases of land have been made as soon as possible.

Mr. RUBEY. But they would not live as far south as Georgia?

Dr. PALMER. Yes, sir; in northern Georgia.

Mr. HOWELL. Do you have to provide feed for elk in Montana, Colorado, and Utah in the winter time?

Dr. PALMER. That brings me to the refuge we have established at Jackson Hole, Wyo. We are there maintaining an elk refuge and raising hay to feed part of the herd which ranges in the Yellowstone Park in summer and comes down into Jackson Hole in winter. We have not yet completed the acquisition of this refuge. We have at the present time about 2,000 acres, of which 1,200 were purchased and about 840 were public lands inclosed within the reservation, in accordance with previous legislation. We are now acquiring some 520 acres additional.

Mr. REILLY. How much are you paying for these 520 acres?

Dr. PALMER. Good hay land can not be had for less than $25 per acre.

Mr. REILLY. And you have purchased how much?

Dr. PALMER. One thousand two hundred acres, and we are now negotiating for 520 acres more, at $25 an acre.

Mr. REILLY. How does that compare with the selling prices in that community?

Dr. PALMER. That seems to be the lowest price. It varies from $25 up to $50 per acre.

Mr. REILLY. Was this region originally a habitat of elk?

Dr. PALMER. Yes, sir; that was part of their original winter home.

Mr. REILLY. Would the elk be able to survive if you did not provide winter feed?

Dr. PALMER. Not if conditions went on as they were going a few years ago. What we are trying to do, in a word, is to raise 1,000 tons of hay a year to feed the elk, if necessary. Last winter was a mild winter, and it was not necessary to feed very much. This year winter set in early, and the reports up to the first of February show that the temperature has ranged from 30° to 40° below zero. There were about 4,000 elk in the refuge when we began feeding two weeks ago.

Mr. REILLY. Is there any alfalfa grown on the refuge?

Dr. PALMER. Yes, sir.

Mr. REILLY. Was that 1,200-acre tract bought from one party?

Dr. PALMER. Yes, sir. We have not attained our standard this year by any means, because we have only part of our refuge under cultivation. We have actually raised about 500 tons of hay, but what we have on hand will carry us through the winter. We hope to double this amount before we get through.

Mr. REILLY. That is native-growth grasses?

Dr. PALMER. No sir; partly alfalfa, partly timothy, and partly wild hay.

Mr. HOWELL. In the shipment of these elk to various localities in the various States it is simply for the purpose of gratifying sentiment, is it not? There is no commercial object in the transplanting?

Dr. PALMER. There is no commercial element at present, but in the future we hope to obtain a good meat supply from the increase of these elk. An elk dressed represents about 300 pounds of meat, and if we get a few more thousand elk there is no reason why a considerable number could not be utilized each year as meat.

The CHAIRMAN. Do you pay the freight and expenses of shipments, or is that borne by the individual?

Dr. PALMER. Mr. Chairman, the department does not distribute any elk to individuals. It distributes only to Federal, State, and municipal authorities. We do not pay the freight if we can get anyone else to pay it, for two reasons; one is, that we have a small appropriation and can not afford to do it, and the second one is we find that people take a great deal more interest in the elk if they pay the freight themselves.

The CHAIRMAN. You give elk sometimes to public parks, etc.?

Dr. PALMER. Yes, sir.

The CHAIRMAN. And whenever you can you make them pay the freight?

Dr. PALMER. Yes, sir.

The CHAIRMAN. You could not pay much freight, of course, out of this small sum?

Dr. PALMER. No, sir; we could not.

Mr. HELGESEN. What would be the result if you compelled the other party to pay the freight always? Would not they do it?

Dr. PALMER. In some cases they are not able to do it, and in some cases they are anxious to cooperate with the Government in putting elk on public lands; in such cases it is only fair that the Government should bear part of the expense.

Mr. HELGESEN. Yes; but when they go to municipal parks——

Dr. PALMER (interposing). Most of the elk have been transferred to public lands, and they have been shipped, I think, to 13 different States in the last five years.

Mr. HOWELL. Do you find, where you provide feed for the elk in the winter time, that it has a tendency to incapacitate them for rustling their own feed?

Dr. PALMER. That has not been our experience so far. We do not undertake to feed all the elk. We feed the calves and some of the cows. We could not feed the whole herd for a period of two months.

Mr. HOWELL. The 4,000 elk that you have been feeding—are they somewhat domesticated?

Dr. PALMER. No, sir; they are as wild as any elk.

Mr. HELGESON. How can you separate the calves from the rest?

Dr. PALMER. One way, and I think it is the best, is to get them into a corral. There is a corral in Jackson Hole where we capture the elk for shipment, and, as far as possible, we get the calves into a corral. We have found that the calves come down from the range a little closer to the ranches than do the bulls. In feeding we scatter out the hay in a line sometimes 5 or 6 miles in length.

Mr. HOWELL. My own town has lately become enthusiastic. We ve a herd of elk which have been confined in the public square.
Dr. PALMER. Where is that?
Mr. HOWELL. Logan, Utah.
The CHAIRMAN. Is there anything further on this point?
Dr. PALMER. I want to call attention to the bracketed item in this . It is an appropriation for the improvement of the game preserve Sullys Hill National Park. The first appropriation was $5,000, for cing the preserve, and we were unable to do anything with it. The mmittee last year added $5,000, making it $10,000. We called for s and let the contract, and the contractor then abandoned the con- ct on account of the unexpected rise in the cost of steel. He was un- e to do the work, and a second contract was let. When the work ler that contract is completed, which will be in June, we shall have the ce and a balance of about $160 on this appropriation. We need ildings, a headquarters, and barns, and we need animals in this park. shall have the park, and the fence will be built as called for, but we ll have nothing in the park; no place for the warden to stay, no d, and no animals.
Mr. HOWELL. What park is that?
Dr. PALMER. The Sullys Hill National Park, located near Devils ke, N. Dak.
Mr. LEE. How long do these fences last?
Dr. PALMER. We have never had any experience in that line. me of our fences have held for 10 years, and I do not think we ve ever had to replace any on account of ordinary wear on the ntana Range, although the fence there has been up for seven years.
Mr. HELGESEN. Replace what?
Dr. PALMER. Replace the wire fencing and the posts.
Mr. HELGESEN. Do you mean the wire or the posts?
Dr. PALMER. Well, where a fire runs through the fence, both the ncing and part of the posts have to be replaced.
Mr. HELGESEN. What is your recommendation as to the Sullys ll National Park?
Dr. PALMER. It seems to me that, when Congress has made an propriation for a project, provision should at least be made to go ead and complete it and make it a success. We would need at st $5,000 to build the headquarters, put in paths, roads, and rns, and get started.
The CHAIRMAN. Perhaps I do not understand this program book, d I think this is about the best time to get familiar with it. On e item "Sullys Hill Game Preserve" the statement is made here, 5,000 carried over from 1915."
Dr. PALMER. Yes, sir.
The CHAIRMAN. So that you have $5,000 available now?
Dr. PALMER. Yes, sir; the appropriation bill for the fiscal year 15 carried an appropriation for $5,000. The appropriation bill for 16 finally carried an item of $5,000 additional.
The CHAIRMAN. That was the item put on by the Senate?
Dr. PALMER. Yes, sir. The item in the Senate was for $10,000, e conference committee allowed half of it, and this with the $5,000 om the previous year makes $10,000.
The CHAIRMAN. You say in the book, "Probable date of comple- on, January 1, 1916; proposed expenditures, 1915–16, $10,000."

[illegible]

Dr. PALMER. No [illegible] arms, no headquarters, no corrals, no roads, no animals.

AN. Now, let me see; you would need $5,000 to give, your roads, and animals?

Dr. PALMER. I think $5,000 would cover that.

The CHAIRMAN. And $2,000——

Dr. PALMER (interposing). I think $5,000 will carry us through the year and make it a going proposition.

The CHAIRMAN. That would include the warden?

Dr. PALMER. Yes, sir.

Mr. REILLY. You make no estimates for the $5,000?

Dr. PALMER. No, sir.

Mr. NELSON. There is one thing which Dr. Palmer failed to bring out in connection with the feeding of elk which it seems to me ought to come in here. The feeding of elk is necessitated by the fact that so much of the winter range has been occupied by farming and by settlers or is grazed over by the settlers' stock that much of the former abundant winter grazing for elk no longer exists. The result is that, while there is an abundance of summer range available for the elk, when the animals are driven down by snow from the high mountains they strike a country largely devoid of feed or a country in which the feed has been reduced to such a low point that, unless they are helped, many of them will simply starve.

Mr. HOWELL. How many elk are permitted to be killed each year in Wyoming?

Mr. NELSON. I do not know, but I think the number is limited. Do you know how many are permitted to be killed in Wyoming annually, Dr. Palmer?

Dr. PALMER. Under the State law each resident may kill two elk—one under an ordinary license, which costs $2.50, and one under a special $10 license; and a nonresident may kill two elk under a license, which costs $50. The actual number killed varies from year to year; so there is no way of determining the exact number, but it is probably about three or four thousand.

Mr. HAWLEY. They kill only the bulls?

Dr. PALMER. Two years ago the State conceived the idea that too many of the bulls were being killed off and allowed each resident to kill one cow under a special license. They have been killing both cows and bulls this last season.

Mr. HAWLEY. Does the Government own the elk, or are they the property of the State?

Dr. PALMER. That is rather a nice question. The elk that stay in the Yellowstone Park all the year belong to the Government beyond question.

Mr. HAWLEY. On the theory that no man can hunt in there without the permission of the Government?

Dr. PALMER. They are on the Government reservation 12 months of the year. The elk that summer in the park and winter in Wyoming belong to the State of Wyoming while they are within its boundaries.

Mr. HAWLEY. On the theory they are feræ naturæ?

Dr. PALMER. Yes, sir.

Mr. HOWELL. Does not that same principle prevail in the national forests?

Dr. PALMER. No, sir. While they are in Wyoming the elk are in the national forests, but they belong to the State of Wyoming.

[illegible] familiar with all [illegible]

[illegible]

Mr. McARTHUR. Yes sir. [illegible]

The CHAIRMAN. Yes.

Mr. McARTHUR. In the present relation of range and [illegible] to agriculture perhaps the largest item [illegible] of prairie dogs on the public lands and [illegible] of the methods of destroying prairie dogs. [illegible] prairie dogs were practically exterminated on [illegible] the national forests at an average cost of 1.8 cents [illegible] first campaign against prairie dogs on a tract of land we [illegible] about 90 per cent or more of the animals. It is sometimes [illegible] to go over the land a second time. We expect to [illegible] Forest Service to do what annual work is needed to keep [illegible] areas free. When the number of animals is greatly red[illegible] area they instinctively collect into small colonies which [illegible] deal with. In the repoisoning process, we covered 359 [illegible] cost of 1.4 cents per acre.

Mr. HAWLEY. This is done on the theory that you can i[illegible] range and range grasses.

Mr. McARTHUR. To increase the capacity of the range. [illegible] Through the general area that is infested by prairie dog[illegible] mated that the capacity of the range is reduced 10 per c[illegible] devastations, and if we get rid of them it means room for [illegible] more stock. In the States infested by prairie dogs their [illegible] would allow the grazing of about 1,000,000 more cattle an[illegible] about the same number of sheep.

Mr. SUTHERLAND. What is the method used in exterminatin[illegible]

Mr. McARTHUR. It is done principally by poisoning, in mo[illegible]

Mr. McATEE. No, sir; the oats are mixed cold. The mixture is prepared and poured on the required quantity of grain in the container and the grain is then stirred until evenly coated.

Mr. STEELE. What do you do then?

Mr. McATEE. For the prairie dogs, it is distributed about a spoonful at a place near the entrance of the burrows. It is distributed by men on horseback. The men have the poison in bags hung from their shoulders. When they come to a colony they distribute the poison over the bare ground, which is usually to be found in these colonies.

Mr. STEELE. I have 80 acres myself, and I wanted to know if you had a better scheme than I have, but I see you have not.

Mr. McATEE. Many people have used our method and have had success with it.

Mr. STEELE. That was about 25 years ago that I was speaking about.

The CHAIRMAN. You are spending about $100,000 on this work?

Mr. McATEE. Yes, sir; we have spent about $61,000 so far and will spend about $45,000 during the balance of the year.

The CHAIRMAN. What else are you doing?

Mr. McATEE. The destruction of pocket gophers on public lands. Pocket gophers, being much more widely distributed than prairie dogs, cause more damage, especially to the farmer and fruit grower. Prairie dogs crop the grass and keep it down but do not necessarily destroy it, but the pocket gophers undermine the land and sometimes eat the grass roots. The Forest Service has encountered great difficulty from pocket gophers in reforestation projects, and our work is of much assistance to them.

Mr. HELGESEN. Do pocket gophers destroy any more than the little pile of dirt on top of the entrance?

Mr. McATEE. Yes, sir; he travels underground and feeds a good deal on the grass roots. He also destroys young trees and crop plants by cutting the roots.

Mr. HELGESEN. I have been familiar with the pocket gophers all my life, and I never have known them to destroy the grass except the pile of dirt they bring up.

Mr. STEELE. Another trouble is that the dirt gets in the mower. How do you kill them?

Mr. McATEE. We use as bait a sweet potato covered with powdered strychnine.

Mr. STEELE. What do you do when you get the potato?

Mr. McATEE. Punch a hole in the burrow and cover the hole up.

Mr. STEELE. Punch a hole in the burrow?

Mr. McATEE. In the runways.

Mr. STEELE. As I understand this pocket gopher, he has a main runway?

Mr. McATEE. Yes, sir.

Mr. STEELE. And when he moves out the dirt, he makes a switch off and piles his dirt outside that?

Mr. McATEE. Yes, sir.

Mr. STEELE. Invariably he goes on the other side with the next switch and puts his pile there. Now, how do you find his runway?

Mr. McATEE. With a pointed prodding implement, which is pushed into the ground with the hand or foot, according to the hardness of the soil.

STANFORD UNIVERSITY

H[OUSE] OF REPRESENTATIVES
COMMITTEE ON A[GRICULTURE]

STATEMENT OF MR. W. L. M[CATEE, ASSISTANT I
INVESTIGATIONS, BUREAU OF BIOLOGICAL S
tinued.

. ANDERSON. Would you mind stating, first, how long this work been carried on?
. MCATEE. This is the third year, I think.
e work done under this project the present year was the clear- f ground squirrels from 96,000 acres of national forests and an n reservation in California. This work was done at a cost of nts per acre. We count on getting 90 per cent of the animals irst time over, and they can be practically exterminated the d time over.
e work planned for the balance of the year is to be on the Cali- a, Modoc, and Sequoia National Forests, for which there is 6 available.
. ANDERSON. Is this a part of the originally contemplated cation of the bubonic plague?
. MCATEE. The relation of ground squirrels to the bubonic e was the thing which brought on the appropriation in the first . The ground squirrels are, however, very destructive on farms ning the national forests, and great complaint has been made the forests are breeding grounds from which private lands are sted after the owners have gone to the expense of clearing their property.
e CHAIRMAN. Is there any possibility of the eradication of the d squirrels, Mr. McAtee, or is your plan one of control?
. MCATEE. I do not believe that they can ever all be destroyed. campaign against squirrels is something that will require a n amount of work every year, but I should think that Govern- aid might be dispensed with some time, because California has good laws on the subject. The private land owners must clear heir land, or it will be done by the State and the cost charged to wners. Hence, if the national forests and other public lands are cleared—that is to say, 95 per cent or more of the animals —the charge that they are breeding grounds for reinfestation ivate lands can not hold.
e CHAIRMAN. Is it your thought that the number of these squir- s gradually decreasing under the work of the bureau?
. MCATEE. The number of squirrels has decreased very remark- in the area we have covered; in fact, in some areas they have completely exterminated. Of course, there are some areas that ve not worked on at all.
e CHAIRMAN. I take it, however, for the present your plan is one ntrol more than of attempting to go in and exterminate. Un- ou had a larger appropriation you could not possibly extermi- them?
MCATEE. I do not suppose we could entirely exterminate them any appropriation within reasonable limits.
. REILLY. What is your general plan of work?
. MCATEE. It is carried on much the same as the prairie dog It is done by poisoning with a bait which has barley as ase. An ounce of strychnine is used to about 16 quarts of y. The grain is coated with the poison and the poison is ab- d by the squirrel while the grain is being carried in its cheek ies. If the squirrel carries some of the grain in its cheek pouches minutes it dies. The preparation in which the strychnine is l is also intended to temporarily neutralize the bitter taste of

[illegible] ... especially. A man can put this bait ... without getting the ... [illegible] not specially treated is ...

... the ground a small quantity of carbon bisulphide ... and the hole plugged. This ... burrows.

Mr. [illegible] ... they inhabit, for instance, an ...

Mr. McATEE. [illegible] ... to the acre in badly infested areas.

Mr. [illegible] ... than the prairie dogs?

Mr. McATEE. ... but are about ... in the infested areas.

The CHAIRMAN. Are there any further questions on that proviso, gentlemen?

What is the object of the next proviso, for the investigation of diseases of wild fowl in the Salt Lake Valley region of Utah?

Mr. NELSON. That is also under Dr. Fisher, and Mr. McAtee can explain it.

The CHAIRMAN. Mr. McAtee tell us about that.

Mr. McATEE. During the present year conditions around Great Salt Lake were not productive of a serious outbreak of this malady, but at the same time the results we obtained went a good ways toward confirming our conclusions of the cause of the disease. During the present season there was a very slight rainfall in the spring, and an excessive amount of water was taken out of the rivers for irrigation. These circumstances prevented the formation of shallow pools on flats about the lake such as have been formed in recent years when the malady has been so prevalent. Our hypothesis is that these shallow pools of strongly alkaline water are where the ducks become affected. We have experimentally produced the malady by giving healthy ducks nothing but the kind of water found in these pools. We have also produced the same symptoms by giving ducks water in which the salts left by evaporation of the pools frequented by these birds have been dissolved. We have demonstrated that a great majority of the sick ducks can be quickly cured by placing them where they have access only to pure water.

This year 586 were treated in this manner, of which 426 were cured. It is thought that this method can be adopted as a remedy by the State game commission and sportsmen, who, of course, are greatly interested in the preservation of wild fowl. It is thought the birds can be given this treatment at a cost of between 5 and 10 cents per bird.

In connection with this investigation, our assistant took the opportunity of learning something more about lead poisoning among wild ducks. There have been several epidemics of lead poisoning, namely, at Lake Surprise, Tex., the Nisqually Flats, Wash., Lake Puckaway, Wis., Currituck Sound, N. C., and elsewhere. In experimental feeding it was found that as few as 10 pellets of No. 6 shot were sufficient to kill a mallard duck. In our examination of ducks, of which I have made thousands personally, we find that shot can almost be considered a normal part of the stomach contents of wild ducks; that is,

e shot are so commonly distributed on the bottom of waters in vorite hunting grounds that the ducks get them along with gravel. the small amount of shot just specified is sufficient to kill a bird, would seem that in many localities the ducks are in serious danger m lead poisoning. I think it very important to follow up this line investigation and see if an antidote can be devised. Of course, if e ducks become sick they can be captured, and if there is a cure it n then be administered.

The CHAIRMAN. I do not remember whether you said what the ouble was with these ducks?

Mr. MCATEE. At Salt Lake?

The CHAIRMAN. Yes.

Mr. MCATEE. It is almost certainly alkaline poisoning.

The CHAIRMAN. What do you propose to do with this $5,000 if lowed?

Mr. MCATEE. If the next season is more favorable, that is to say, more ducks are sick out there next year, it would give us a chance absolutely determine whether we are or are not right in considering kaline poisoning as the only cause of the malady. The lead-poison- investigation also could be continued.

The CHAIRMAN. You would not have authority for the study of eir increase and decrease; would you have to obtain other au- ority?

Mr. MCATEE. I believe we could do that under our other appropria- n, but such an arrangement would make it necessary for the assist- t to keep two expense accounts and separate all items. Most of r men now complain they are being turned into bookkeepers in- ead of investigators, and for that reason we always try to avoid ving a man keep separate expense accounts if we can.

The CHAIRMAN. I think there is a good deal to that suggestion.

Mr. HOWELL. Have your investigations led you to determine the tent of the area in which the ducks of Salt Lake have their flight?

Mr. MCATEE. I am very glad you mention that. I had almost for- tten something I wish to show you.

I have here a map [exhibiting], Salt Lake being the black spot in e middle, and these red spots localities in various parts of the untry east and west where the ducks have been recovered which d been banded at Great Salt Lake. It seems to illustrate a new eory of bird migration, which we may call the "bomb theory," cause the birds seem to explode and go in all directions from the ntral point. However, the largest number were taken in California, d the strongest line of migration from Great Salt Lake seems to be ward California.

Mr. HOWELL. The Salt Lake region is a general rendezvous for the tire mountain country, is it not?

Mr. MCATEE. Yes. Many ducks which wander in winter over all e western United States congregate in fall at Great Salt Lake. So e duck malady there affects not only Utah but practically the whole estern United States.

The CHAIRMAN. Are there any further questions to be asked in re- rd to this item?

Mr. HOWELL. I will ask one more question. Have you found that is malady is contagious to any extent?

STATEMENT OF MR. E. W. NELSON, ASSISTANT CHIEF OF THE BUREAU OF BIOLOGICAL SURVEY—Continued.

Mr. HAUGEN. Doctor, you are making a request here for $125,000 and the Director of the Budget has allowed you $5,000. So you will have available for the next fiscal year $130,000 and from now until the end of the fiscal year you will have $5,000 additional to the present rate of $10,000. Is that right, Doctor?

Mr. NELSON. That is right, Mr. Chairman. The $125,000 is the total of our requirements and the $5,000 is the amount that was put in the agricultural deficiency bill to meet the sudden outbreak of rabies or rather the increase of the rabies, which has existed for some time in certain parts of the West. After our estimates were submitted, the people out there seemed to have additional money in order to increase our force of men to try and control the coyote and other predatory animals which were spreading the rabies.

Mr. HAWLEY. The only way to get rid of the coyote or other wild animals which become infected is to kill them; they can not be poisoned?

Mr. NELSON. These animals probably would not take poison after they are infected. They are sick animals, and practically insane. They have lost all their normal instincts and must be shot or trapped.

We are asking for an increase of $5,000 to start a more extensive campaign in the United States to control the disease and try to prevent its spread. This will necessitate, of course, at the expiration of the present fiscal year, an additional appropriation which will be provided by the $5,000 now being expended by the Secretary, to continue the work in the organized territory.

In addition to the $5,000 in the item of appropriation, and which is now being expended by the Secretary, to continue the work in the organized territory, there is also available for the control of predatory animals and rodents in the National Forests of the West, in New Mexico, Arizona, and California, the sum of $75,000 and the Secretary of Agriculture has $25,000 more sum of funds to be used in the National Forests where rodents prevail. This is really all the money we have.

Mr. HAWLEY. Does it practically free the pack rabbits?

ELSON. Yes; they commonly feed on jack rabbits.
AWLEY. Let me put it in the form of a question. Do these with the rabies attack jack rabbits, or do they forget all od?
ELSON. I could not definitely answer that, but I think they all about food.
AWLEY. What I had in mind was whether there is any danger of infection through the jack rabbits.
ELSON. I think that would be extremely unlikely. The bits undoubtedly die if bitten. The chances are that if a it a jack rabbit he would kill it on the spot or injure it so that it would die very soon; but the coyotes, of course, bite otes and thus spread the rabies. There are a great many n that region, and the rabid ones wander about biting any hey encounter and the disease continues to spread indefi- It has spread now over an area about 400 miles long and wide. It started probably in eastern Oregon, in 1910, and spreading ever since. Apparently it has increased and is ive now than at any previous period. If the disease keeps likely to spread all over the Western States. There is no w far it might go.
AWLEY. Is this outbreak of the infection confined to a cer- lity? You say it is an area about 400 miles long.
ELSON. There is an infected territory about 400 miles long. map [indicating] giving the area where it is at present.
AWLEY. What States does it cover?
ELSON. This part of northeastern California [indicating], Nevada, southwestern Idaho, and eastern Oregon, and it is in the southeastern corner of Washington [indicating].
AWLEY. What is your plan of control there—to throw a line at area?
ELSON. The plan will be to try to eliminate the coyotes as possible around the borders of the infested area and thus somewhat on the plan of a fire guard; then to reduce the of coyotes in that area to so small a number that if a coyote e rabies he will die before he has an opportunity to bite ne; in other words, to decrease the number of these animals y are so scarce that it will be unlikely that a rabid coyote another coyote to pass it along.
AWLEY. Do you think your plan is feasible?
LSON. I think it is, providing we can keep a continuous going. This $75,000 in the emergency appropriation almost thrown away unless we could have funds to continue after the 1st of July. We would destroy coyotes over a certain if we did not continue the work they would simply come from the adjacent territory. If, however, we can keep the om spreading for a year and a half, or something like that, es are we can stop it. We will be helped by the States.
eived notice the other day from the Wool Growers' Asso- Nevada that they had appropriated $10,000 to cooperate and I think the State of Nevada has set aside $100,000 for . They are eager for cooperation there; and they are cooperating, as Judge Raker said, in California. All the

[illegible]

[illegible] or four months.

[illegible]

[illegible]

[illegible]

[illegible] 1,000 people treated at the State University, [illegible]

[illegible] specimens have been examined from northeastern California, 124 of which showed positive evidence of rabies. In Idaho 93 animals were examined, 41 of which were coyotes, and 35 out of the 93 showed positive evidence of rabies.

In Oregon 75 people were given treatment by the State health officer during 1913. In central California last fall, on the ranch next to the one where I was, the people had a pet dog which, one morning, suddenly flew at the man and his wife and bit both of them. They killed the dog, took it up to Berkeley, and learned that he had rabies. Both took the Pasteur treatment and had no further trouble.

Of course, the thing comes on without the slightest warning. Under such conditions there is really a very imminent danger to every one in that region.

The CHAIRMAN. Mr. Harrison has submitted some additional language for this item. I will read it. It is to go after the word "husbandry" at the end of this paragraph.

That of this sum not less than $125,000 shall be used on the public lands, national forests, and elsewhere in the Western and Northwestern States for the protection of stock and other domestic animals, through the suppression of rabies, by the destruction of coyotes and other predatory wild animals.

[illegible]ds, it is your plan, if this committee acts favorably upon [illegible], to use $125,000 of this money in your rabies work?

NELSON. The plan is to have appropriated $125,000, to be
r a continuing campaign, which is an emergency matter. It
the regular appropriation. This money is to be used in the
infected area, or any other area where there may be a serious
ak of rabies.
CHAIRMAN. I understand that, but what I was trying to find
s this: If this appropriation is allowed, you would use not less
275,000 of this total appropriation in your predatory-animal

RUBEY. I understand you want to use $125,000, and then
e——
NELSON. I understood you, Mr. Chairman, to mean to use
)0 out of the regular appropriation.
RUBEY. No. If the estimates are allowed under this last
), you will have $250,000. Out of that sum you want to use
)0 for rabies work?
CHAIRMAN. No; I do not think so. Mr. Harrison, will you
1?
HARRISON. The suggestion is that the total amount to be
riated by paragraph 26 be increased from $275,540 to $400,540.
1, it is suggested that a colon be inserted after the last words
paragraph, "animal husbandry," and that a new proviso be
carrying $125,000 for work directly in connection with the
ssion of rabies. The amount of $125,000 now shown in the
tes will be used for work in the general field for destroying
, coyotes, and other predatory animals which prey upon
)ck, without reference to the rabies problem.
ANDERSON. Then, your total appropriation for this rabies
would amount to $325,000, including the amount in the urgent
ıcy bill?
NELSON. Including the amount in the urgent deficiency bill,
ld give $200,000 for work on rabies. The other money is for
n the general field, which we are doing without reference to
)ies problem.
ANDERSON. I do not get that.
CHAIRMAN. You provide $125,000 and you are given $75,000.
would make $200,000 for rabies work.
NELSON. But, Mr. Chairman, the $75,000 is to be used be-
now and the first of July. The $125,000 is to continue the
campaign next year.
ANDERSON. This language, then, is proposed as a substitute
last proviso?
CHAIRMAN. It is in addition to it. It is a further addition to
ole appropriation.
McLAUGHLIN. Is not a part of that $275,540 available for
)o, and included in the appropriation?
HAWLEY. The last proviso in the paragraph as it stands
the activities to the national forests and public domain, and
ant now authority for $125,000 more to use anywhere these
s or infected animals are and catch and kill them.
ANDERSON. What I am trying to get at is how much money
ant altogether.
HOWELL. They want $400,540 all told for the next fiscal year.
McLAUGHLIN. Will this wording of the proviso or the wording
)ther paragraph there permit the payment of bounties?

he thing right back to the same level again. In other words, they o not keep at any persistent campaign which will exterminate or educe the coyotes to a harmless number in any district.

Mr. HELGESEN. They always keep it going?

Mr. NELSON. They always keep a supply on hand.

We have here a series of years from 1900 to 1909 in Kansas, showng the total payments on bounties, to enable you to see how steadily t continues: $22,952, $19,097, $18,736, $17,493, $18,440, $18,604, 20,113, $22,091, $26,086, $25,830. The bounties really increased, so hat at the end of 10 years they were paying more than they were at he beginning. That is the usual outcome of a bounty system.

Mr. HOWELL. Do you require your hunters to make a report of he number of animals killed?

Mr. NELSON. Perhaps I had better explain the method by which he work is carried on. The country is divided into districts. We ave eight or nine districts, each one with an inspector, these inspecors all being appointed under civil service. They are empowered to ire hunters at $75 a month, if the hunter and trapper simply works ithout any outfit. If he has an outfit he is allowed $10 a month or its use and $15 a month for each of two horses. That is a possible mount of $115 a month for a hunter with two horses and an outfit. s a matter of fact, we are only paying $105 a month as the maxinum. Ninety dollars a month is quite a common sum, and these nen are required——

Mr. HOWELL. I was going to inquire if those hunters employed by ou have the pelts of the animals they kill and also the opportunity o receive bounties?

Mr. NELSON. No, sir. These men are hired with the distinct nderstanding that they are not to receive bounty; that they must eep a record of every skin they get and transmit it to Washington. We are receiving those skins here from every one of our men, and the nspector in charge of these hunters is required to keep track of his nen and see that they live up to this requirement. If a man is ound taking bounty, or anything of that kind, he is dropped.

The CHAIRMAN. What do you do with the skins when you get hem?

Mr. NELSON. We pick out the best of the skins and save them for cientific specimens. The idea is to have not only enough for the Iational Museum but to get enough so that we can distribute them o the university museums in all the States.

Mr. HELGESEN. If you get a surplus, what will you do with them?

Mr. NELSON. The surplus skins we are selling here at auction. We have already sold over $1,300 worth of the skins which have een sent in during the last two or three months.

Mr. HAWLEY. Do they send them in in pretty good shape?

Mr. NELSON. Yes. Every hunter is instructed how to take the kin off so that it will arrive here in good marketable shape.

The CHAIRMAN. Did you turn the money you received from that nto the Treasury?

Mr. NELSON. Yes, sir; the money received from that source is urned into the Treasury, the same as the money received from the le of any public property. There will be some thousands of skins old and some thousands of dollars to go into the Treasury as an annual return on this work.

Mr. [illegible]. Do you what is your average [illegible] you have to get per month? Have you those reports?

Mr. NEWMAN. We get reports. One of our new [illegible] was promptly dropped for inefficiency.

Mr. [illegible]. You pay $105 now for that one coyote. That is what we are trying to get at as whether these fellows hunt or whether they trail.

Mr. NEWMAN. I will tell you——

Mr. [illegible]. I would like to have an average. I would like to have the number of hunters that you have in these districts. I would also like to have the average number of coyotes that they have killed in those districts that you have had them there.

Mr. NEWMAN. I can not give you that offhand. However, we can get it for you.

Mr. [illegible]. I would like to know. If your coyotes are costing you $105 per head I believe your system is a poor one to exterminate coyotes.

The CHAIRMAN. Let me say here that it is unfortunate when you gentlemen make a statement like that. It is very good to have it before the committee but it creates a wrong impression. You said one man was being paid $105 and that he killed one coyote; but you further said that you dropped the man after that. It would be better to emphasize that or else the story will go out that we are appropriating money so that you can pay $105 a month for one coyote.

Mr. [illegible]. The point is, I want to know——

Mr. CHAIRMAN. If you will give him time he will tell.

Mr. NEWMAN. I did not get through with my statement.

The CHAIRMAN. That is the difficulty. The witnesses are not allowed to complete their statements.

Mr. NEWMAN. One of our men got 37 coyotes and 13 bobcats in one month. The men who fail to make good are promptly discharged. It is impossible to keep these men to avoid occasionally getting a poor one. We do the best we can, and the inspectors are given stringent instructions not to take any man who can not be recommended by people of good standing as being reliable. But, in spite of that, we do get some worthless men, but naturally our inspectors do not know a man is worthless until he has had a month's trial; and we immediately drop that man if he is found deficient. The good men sometimes get up to 40 or 50 predatory animals a month, but this depends, of course, on the locality.

We [illegible] the Bull Mountains, Wyo., where great depredations have been done by wolves. Our man found that the damage was done by two or three wolves. He spent a month or six weeks there and finally trapped the old dog wolf, the leader of the pack, and [illegible] depredations on stock in that district ceased. One [illegible] in that district estimated that the old wolf killed [illegible] more than $1,000 damage to stock. Of course, if a [illegible] where depredations are being carried on by a [illegible] make a big record for number of animals [illegible] for saving stock. When he gets [illegible] he is appreciated.

Mr. [illegible]. How is the point I want to know about. I want to get it on the record. I want to know whether your hunter who has found the home of this she wolf goes to work and digs it out and finds six or eight young wolves, whether he is a digger or just a hunter

who is walking around carrying a rifle, or what he is doing. How do you do that?

Then I would like to know just how many men you employ per month and how many coyotes you kill a month, or how many skins are sent in, to get an average of the cost of these coyotes.

The CHAIRMAN. You furnished that to us two years ago, Doctor, and I wish you would do it again.

Mr. NELSON. We can get that information in the office and will furnish it in the form of a letter.

The CHAIRMAN. Not only coyotes but also wolves.

Doctor, will you tell us something about how these animals breed—about the period of gestation?

Mr. NELSON. I think it is approximately that of dogs. Of course, the wolf and the coyote are cousins of the dogs.

Mr. HELGESEN. They breed in litters?

Mr. NELSON. Yes, sir. I will also answer the question in regard to getting animals in dens. We plan to put on many extra men in the spring to hunt dens and destroy the young and to put most of our regular hunters at the same work. Coyotes and wolves breed once a year, in the spring, and by having our men hunt their dens and kill the young they can do more effective work than in any other way. When a man finds a den he not only kills the old wolf or coyote but kills anywhere from six to a dozen young. In one case one of our men found 13 young in a den and made a record of 14 coyotes for that day.

Mr. HELGESEN. Have you had any experience with poisoning them?

Mr. NELSON. Yes; we have had experience poisoning them, and experiments will be made this year in Utah and elsewhere to see how effectual wholesale poisoning will be. But the poisoning campaign will go on with the hunt. Predatory animals are being poisoned, they are being shot, and they are being trapped. Last fall one of our trappers in Colorado had a trap line about 50 miles long. He used several horses in his work, and it took him several days to make the round of his traps. Another man in Idaho had a similar trap line.

Trapping and hunting is hard work, and the men are required to keep at it diligently. They are held right up to good effective service. No loafing or trickery of any kind is tolerated.

Mr. HELGESEN. I would suggest that if you are poisoning as well as shooting and trapping, it would be impossible for you to give the exact result of your work in numbers, because many a wolf that is poisoned is never found. The question is, can you clean up a district?

Mr. NELSON. Our experience has been this: Mr. Sans, our inspector in Nevada, reports that when he has put men into districts where a lot of damage was being done by coyotes to stock, the first month a man would get something like 30 coyotes, and the next month about 20, and about the end of the second month the losses in stock practically ceased. In other words, he had reduced the number of coyotes until the stock was practically safe. But the hunter still continues, for the idea is to not stop when you have reduced the number, but to keep on until you nearly or quite exterminate them in that district. In such an instance, toward the end it will cost us considerable to get some of our coyotes, but the result will be

[illegible]

Mr. NELSON. Wolves can be entirely eliminated from certain parts of the country by trained hunters to follow the last wolf until they get him and [illegible] all future danger from that source. Under the present system you can spend money for the next 50 years and still have [illegible]

There are few of these predatory animals which travel great distances except on the [illegible] country. When heavy snow falls in the mountains the coyotes come down on the plains with the sheep and return to the high country with them in spring.

Mr. HOWELL. What has been your observation with reference to the use of hounds in the rabies-infested districts?

Mr. NELSON. One would not dare use a hound in the rabies country because the deer would be bitten by a rabid coyote and then pass the disease on to the hunter himself.

Mr. HOWELL. Ordinarily an efficient corps of hounds is one of the best protections you can have, is it not?

Mr. NELSON. Unless specially trained, hounds do not bother coyotes very much. In fact coyotes and dogs frequently chum together. I would be too expensive to keep hounds to hunt coyotes except on large ranches. Dogs are necessary in hunting mountain lions. Traps can not be used very successfully for these animals.

The CHAIRMAN. Some few years ago you made an estimate of the number of coyotes, mountain lions, and other predatory animals. I would like to know how you made the estimate, but you did. I was wondering if you had any estimate of the number of coyotes, mountain lions and other predatory animals.

Mr. NELSON. I would hesitate to estimate that. I think, Mr. Chairman, that perhaps you refer to the acreage occupied by prairie dogs. I doubt if we ever made a guess on the number of prairie dogs.

The CHAIRMAN. Maybe it was 25,000,000 acres that you estimated.

Mr. SLOAN. Doctor about hounds. Do you think it is possible for a rancher to have hounds to catch wolves?

Mr. NELSON. Not on an ordinary ranch, because I think the cost of maintaining hounds would be out of proportion to the result. As a proposition I do not think it would be practicable

WELL. My observation is that you should have a hound to
S.
ELE. Take my own experience along that line: I have a
20,000 acres that I lease in the State of South Dakota. I
e to raise cattle, and the coyotes commenced killing the
obtained a bunch of hounds. I made a business of it and
or 20 coyotes with those hounds; and then I found their
and where they raised their young, and I put men to
ose out, and I do not believe I have a coyote within 10
at ranch now.
SON. The trouble is they will come back. If numerous in
country and you eliminate them from one district, that
xterminate them and they drift back into the freed district

ELE. I found the hounds were a very profitable adjunct
ch in killing coyotes.
SON. They could probably have been killed cheaper by
and trapping.
ELE. We tried that. The coyote is a pretty foxy old boy.
AIRMAN. That is all very interesting, but I think he ought
n an opportunity to say what he wants to do with this
year. Are there any further questions?
ERSON. Doctor, yesterday when I was inquiring about
se in the travel expense for your bureau, you suggested
of it at least was accounted for by the item of $125,000
ticular appropriation. In looking over my figures, I found
00 was not considered but that this increase covers items
e in the appropriation bill of 1915 and have been in it ever

SON. Our total appropriation for 1914 was $170,990; for
1,290; for 1916, $446,290. There has been an increase
.
ERSON. That is in the total appropriation.
SON. These increases have all been for field work, which
large amount of travel. For instance, I was just speaking
edatory-animal inspectors. Each inspector usually has
20 hunters. One inspector has 50 hunters under him in
d a number of others in northeastern California. He has
inually traveling to each of those hunters individually, so
them up to their work. It is the same way with the work
pression of the various other noxious animals. The men
are continually traveling. The inspectors under the
-bird law, 17 in number, are continually traveling. That
ey are employed for. The men who investigate violations
ey Act also have to travel. Some of the men connected
eservations have to travel. In other words, ours is a field
d for the proper conduct of the work it means much and
travel. Furthermore, the cost is high because the travel
inly in the West, where the charge for all forms of service
High prices prevail for the hire of teams or automobiles
other expenses incident to travel. I think most of the
on the committee are aware that it costs more to travel
t than in the East.

Mr. McLAUGHLIN. Can you give us some idea of how many are added permanently that is, who come under the civil service in the new work of exterminating animals?

Mr. NELSON. There are eight or nine permanent inspectors in the predatory animal work.

Mr. HASKINS. Are they on the permanent roll now?

Mr. NELSON. Yes; the inspectors come in under civil service. We hold examinations for the inspectors who must be men who had experience in hunting and trapping and must have certain moral qualifications as well as high standing in their community, honesty and energy.

The CHAIRMAN. Now, will you please answer Mr. McLaughlin's question as to how many more inspectors you will need for this formal work.

Mr. NELSON. Under the $75,000 appropriation?

Mr. McLAUGHLIN. For this work, that you are doing?

The CHAIRMAN. For this additional increase of $[illegible]. We are not concerned with the $75,000. That has gone through all right.

Mr. NELSON. The $125,000 will mean about 14 additional inspectors and 140 hunters. We have found that 10 or 12 hunters are about as many as one inspector can handle to the best advantage and shall probably expect to increase the inspectors in the work already in hand.

The CHAIRMAN. Gentlemen, let us pass to the next item, No. 5, for biological investigations, including the relations, habits, and economic [illegible]. Briefly, what do you do?

Mr. NELSON. Perhaps the best way will be to take it up as it is in the Program of Work, as these investigations are divided into projects.

The first project includes the biological surveys of the States and Territories. A scientific expert is placed in charge of the work in each State. We send him out, sometimes by himself and sometimes with assistants, to traverse the State in all directions for the purpose of collecting specimens of all the kinds of birds, mammals, and the plants in order to learn their distribution.

The work also includes a careful study of the abundance and habits of the wild birds and mammals. The resulting information is of great value as a basis for the investigation of the relations of the birds and mammals to agriculture and also gives us the data on which to base the climatic districts of the State in our final report.

Here is, for example, our climatic or zone map of New Mexico. We have not yet finished the work there and this map shows the life zones or climatic areas in colors. This [illegible] indicating is the warm belt of New Mexico. It comes up the river valleys and is the area in which various southern products grow.

Mr. McLAUGHLIN. Will you give the color, so that the reporter can get it as you indicate those areas?

Mr. NELSON. We will call the color of the warm area brown. The yellow is the high plateau districts of New Mexico and includes the sage brush and treeless plains. Above that comes the blue, which is the yellow pine country. Above the yellow-pine country comes the green, which is the zone of aspens, firs, and spruces. The red is the timber line area, and the white is the perpetual-snow country.

Mr. McLAUGHLIN. I asked that in order that we might know something about it afterwards looked at the map and had the reporter before

Mr. NELSON. These maps show you at a glance what climatic districts are included in a State; as you all know, the distribution of life is governed by climatic conditions. The different climatic zones or belts are marked by differences in their native birds, mammals, and plants. On the legend at one side of the map we have set out a list of the characteristic birds, mammals, and plants peculiar to each one of the climatic zones.

The idea in preparing this map is to have it published for distribution to every school in the State for educational purposes; 2,000 of them can be published for about $200, and they can be distributed to State schools at a very slight cost. I think you will appreciate at a glance the fact that such a map has great educational value. For instance, every yellow-pine forest in New Mexico is indicated by the blue areas. It is very instructive for the people to know the physical characteristics of their States.

The CHAIRMAN. How many States have you covered with such maps?

Mr. NELSON. We have finished three. We have nearly finished six or seven, and we have part of the work done in nearly all of the other States. We have been carrying on that work for 30 years and we have a vast mass of material, and we can hereafter turn out the results more and more rapidly.

Mr. MCLAUGHLIN. What do you estimate the cost of covering one State to be?

Mr. NELSON. That depends, of course, on the size of the State and the variation in its surface. For instance, one of the Mississippi Valley States that is nearly level would not cost anything like as much as a State with a greatly varied surface, like New Mexico, where we must go into every mountain range and make one or several traverses to learn the distribution of life on it.

Mr. MCLAUGHLIN. Are you able to tell us what the cost of making this survey of New Mexico is in order to produce this map?

Mr. NELSON. I could not answer that question, because the work has been going on, off and on, as we had money to put in it, for years. I suppose it has been going on 10 or 15 years, and it would require considerable work on the book accounts to determine the cost. But this map is not the only result. The main object of the work is to get definite information as to the birds and mammals which occur in the State and their distribution, to be used in connection with a study of the economic relations of these birds and mammals to agriculture.

The CHAIRMAN. Are there any further questions? If not, we will take up item No. 28, the provision for enforcing the provisions of the migratory-game law.

Mr. NELSON. I beg your pardon, there are several other items under this same appropriation.

The CHAIRMAN. Please cover that rapidly.

Mr. NELSON. The work I have just been telling about is in individual States, but we require some general knowledge of the birds and mammals, and particularly the game animals, in the country at large; so under that heading of birds and mammals on the public domain we do that generalized work in order to have the information available.

[illegible]

Mr. HEMPHILL. [illegible]

Mr. [illegible]

[illegible]

Mr. HEMPHILL. [illegible]

Mr. [illegible]

[illegible]

Mr. HEMPHILL. [illegible]

Mr. [illegible]

[illegible]

The CHAIRMAN. [illegible]

Mr. NELSON. Bird migration does not interest the sportsmen so much. Prof. Cooke has made a specialty of this subject for years and has an enormous file of data secured largely through the help of volunteer observers. We have [illegible] over the United States, and some in Canada, who are making observations during the fall and spring and sending in the information gathered. These results are tabulated and from them we get the information necessary for making regulations in accordance with the migratory bird law and for other work of that kind. Such information is useful also to the States in connection with making their game laws.

Mr. HEMPHILL. Do you pay these observers anything?

Mr. NELSON. Nothing, it is purely voluntary.

Mr. HEMPHILL. We have been told that nobody can work for the Government unless he is paid for it.

Mr. NELSON. We do not pay those people anything, except that we send them certain official publications.

It is surprising the number of people there are in the country who are interested in birds. The growth of this interest is amazing. Two years ago it occurred to me that it would be a good plan to see if we could not make a national bird census.

Mr. HEMPHILL. That, I should think, would be worse to accomplish than the prairie dog census.

Mr. NELSON. I think I can convince you that it is quite possible to get a bird census.

The CHAIRMAN. I am "from Missouri" on that.

Mr. HEMPHILL. What good would it be if you had that?

Mr. NELSON. I think I can answer that question satisfactorily.

The CHAIRMAN. Doctor, go ahead.

Mr. NELSON. The plan is this: We sent out circulars giving instructions for the work and inviting those interested to cooperate. The newspapers gave the matter great publicity, and we got something like 700 volunteer census takers the first year. The object was to try and learn the number of birds that were nesting on farms. Each observer sent us a plat showing his farm, accompanied by the name

of the owner and the exact location. This was required with the idea that we would repeat the census year after year in the same area, in order to get continuous and definite results.

Mr. HELGESEN. Then what did you do—multiply the acres in that farm or divide by the number of acres?

Mr. NELSON. I think if I continue my description that will appear. We got about 200 people the first year, and curiously enough those people listed the birds (of course, only people who knew the birds could do that) on their farms. They simply went around and found the nests or located the male birds singing. If the male bird is found singing the first of June the female and the nest are near by.

So, these 200 people counted the number of birds on their places. The proof that it is possible to get a nearly accurate bird census is evident in the fact that the returns from these farms averaged almost uniformly one pair of birds to the acre in the Eastern States.

This year's census was made by about 300 people, covering the whole United States, and the average for the country, from the Mississippi Valley east, is one pair of birds to the acre—the same as last year. One observer in Vermont has taken observations for six or eight years, on the same farm, and the average is almost identical—one pair of birds to the acre each year.

In Pennsylvania, in 1900, a bird census was taken on a large tract of land near Philadelphia. The average was practically one pair of birds to the acre. Last year the census was repeated, and gave the same average.

In other words, the general average of birds on the average farm and in the United States bearing mixed crops, orchards, patches of woodland, etc., is one pair of birds to the acre.

Mr. HAWLEY. That includes game birds and song birds?

Mr. NELSON. It includes every wild bird. These are ordinary conditions. Here near Chevy Chase a man has been protecting birds on his land, keeping the cats away, putting out a little food and providing water, and he got four pairs of birds to the acre.

In other words, the practical outcome is that we find the normal average is one pair of birds to the acre in the farming communities in this country. By a little care in protecting and feeding the birds in hard times, you can increase it and make four times as many birds to the acre as there are at present.

Mr. WILSON. Does that increase include the English sparrow?

Mr. NELSON. No, sir; I hope we will not increase the numbers of that bird.

Mr. MCLAUGHLIN. Are you able to tell us the cost of that particular kind of work?

Mr. NELSON. It is purely voluntary. It does not cost us a dollar, except the time of the men in our office to compile the results. It is all voluntary, just as in the bird-migration observations. The amount of work that we get is the result of the interest that is shown by those furnishing the bird census scattered all over the country from the Atlantic to the Pacific. That work has created very great interest, and I think that we have absolutely shown that we can get an approximately average result. The fact that all over this whole region you get the same general results from those different observers seems to me answers the question that we are getting definite results.

Mr. WILSON. Does that average prevail in the States where there are few trees and where the authorities have been giving premiums or premiums or something of that kind, for setting out trees?

Mr. NELSON. When you get west of the Mississippi Valley the conditions change and we will probably find a different average there. This average that we have worked out covers the Mississippi Valley and eastward. We have not data enough to give us very definite results as to the West. Our data also covers the South, from the Gulf northward to the great lakes.

The CHAIRMAN. I think you have about answered Mr. Wilson's question. Will you now state as to the economic value of this work?

Mr. NELSON. Everyone knows that the birds are valuable to agriculture, and if we can show the possibility of inducing four pairs of birds to live where one pair now exists we have done something worth while.

Mr. MCLAUGHLIN. Do you approve what some gentleman connected with your bureau—I believe it was the chief—said at one time, that there is only one bird in this country, the English sparrow, that does more harm than good to agriculture?

Mr. NELSON. I think that the English sparrow perhaps does more harm than some other birds are at times harmful.

Mr. MCLAUGHLIN. I think some one of your gentlemen said that the English sparrow is the only bird in this country that does more harm than good, that the others ought to be, in a way, encouraged a little more.

Mr. NELSON. The habits of birds are not always the same. The crow is a beneficial bird in some cases and a very injurious bird in others. We can not say that a bird is always good. They are not. Once, when I was in the robins came down in vast numbers, owing to the severe winter, and nearly cleaned up the olive crop. Nobody in California will agree that those birds were beneficial that year.

Mr. MCLAUGHLIN. Generally speaking, what would you say?

Mr. NELSON. Generally speaking, I would say that most birds are beneficial.

Mr. MCLAUGHLIN. Is that as far as you would care to go?

Mr. NELSON. The great majority of birds are very beneficial. Most hawks are beneficial, owing to the fact that they live on rodents and pests of that kind which are injurious to the farmer. There are other hawks, however, that prey almost wholly on birds and on poultry, and in consequence are purely injurious.

Mr. SIEFERT. In reference to this item on gophers, I would like to take up ground squirrels in the national forests.

The CHAIRMAN. We have completed that.

Mr. SIEFERT. Yes, we have completed that, but you appropriate $15,000 a year, and of course this is generally appreciated by neighboring landowners. Are you killing these gophers just particularly for the landowners near your national forests?

Mr. NELSON. Those gophers are extremely destructive, and the Forest Service

Mr. SIEFERT. These are ground squirrels—the little striped fellows which run around.

Mr. NELSON. Ground squirrels destroy grazing and crops and are injurious wherever they occur. Wherever these ground squirrels damage either grazing or crops, their destruction is a great benefit.

Mr. STEELE. How much money has been spent in Nebraska, South Dakota, and Iowa, and the different States to destroy these ground squirrels?

Mr. NELSON. The ground squirrels in those States are not abundant to the extent that they are in California, except in North Dakota, where we are cooperating with the State agricultural college in squirrel work.

Mr. STEELE. I see this item over here on "crawfish." You have no Government lands down in Mississippi, have you?

Mr. MCATEE. The work under that item has been entirely in the nature of demonstration work and not extermination.

Mr. NELSON. The crawfish in certain lands in Mississippi and Alabama are very destructive to cotton. As fast as cotton was planted and came up, the crawfish nipped off the tender shoots. The planters there applied to the department for relief, and finally the crawfish investigation drifted to us. Dr. Fisher went down there and finally worked out the plan of killing crawfish with bisulphide of carbon applied from oil cans with long nozzles, such as the engineers on the railroads use. The men go around and drop a few drops of bisulphide from the nozzle into each hole made by crawfish. The bisulphide of carbon is heavy and volatilizes quickly; it drops into the water in the crawfish holes, where it sinks to the bottom and kills the crawfish. A negro farm hand can go over a piece of land and exterminate the crawfish at a cost of about $1 an acre the first year and 25 cents for subsequent years. They can thus absolutely eliminate the crawfish from the land, and the planter can go ahead and get in his crop of cotton without losses from this source.

Mr. CANDLER. I think I stirred that work up, and we got splendid results from it in Mississippi.

Mr. STEELE. How much money in your bureau was used in the national forests for the benefit of the farmers?

Mr. NELSON. $15,000 was specifically appropriated.

Mr. STEELE. That was this year. How much last year?

Mr. NELSON. It was the same last year.

The CHAIRMAN. There has been $15,000 expended for three or four years.

Mr. HOWELL. The primary object of that appropriation is to improve the grazing conditions on the public lands?

Mr. NELSON. And also to eliminate the complaint of farmers who thought that the United States was maintaining these lands as breeding places for pests which swarmed out and destroyed crops. Many farmers claimed that when they planted crops the animals which live on the Government land would destroy them.

Mr. HAUGEN. And after all, it is only a benefit to those people in those States?

Mr. HOWELL. It was stated yesterday that the capacity of the forest reserves increased 10 per cent by the extermination of these pests.

Mr. NELSON. It was increased 10 per cent by the destruction of prairie dogs and approximately the same thing for ground squirrels. In some places where ground squirrels were abundant they have been almost completely destroyed.

Mr. HOWELL. Increasing the revenues from grazing on the forest reserves?

[illegible] APPROPRIATION BILL

[illegible]

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[illegible] to the forest reserves. Wherever

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[illegible] to help the people. We send a man to the

[illegible] how to handle the problem.

For example, the pocket gopher caused great damage to irrigating canals in Nevada, one pocket gopher causing a washout in a ditch bank one night that cost the Reclamation Service $2,500 to replace. We taught those people and their ditch tenders how to get rid of the gophers and they have had no further trouble. Before that there was one washout after another. The pocket gophers would burrow into the bank until they got near the water and then the water would break through, causing a washout.

Wherever pocket gophers prove to be specially injurious and we are notified, we furnish information how to exterminate them. The method we have developed is almost infallible. For instance, it might interest you to know that seven years ago we had a letter from an American company which had a large sugar-cane plantation in Vera Cruz, Mexico, saying that the pocket gopher down there (which is a very large animal—three or four times as big as ours) was ruining the plantation. They had spent thousands of dollars and found themselves unable to do anything with them. They reported that.

nless we could help them, they might have to abandon the planta-on. We sent them the necessary directions, and some weeks later e received a letter expressing their appreciation and stating that ney had wiped out the pocket gopher and would have no further rouble.

Mr. HAUGEN. As I understand it, you go into certain localities or nd your men there to demonstrate; in other places you send out ostals or write a letter?

Mr. NELSON. In some cases we write a letter to a man giving the rmula and instructions how to use it. It is so simple that almost nyone can follow the instructions and get results.

Mr. HAUGEN. Now, since the suggestion of Brother Steele, I hope nat some benefits may come from this.

Mr. NELSON. If we get a complaint of serious damages by gophers om anywhere, we do our best to help remedy it.

Mr. HELGESEN. And I suggest, if they put in an application of that nd, they will also have to admit they are not as intelligent as the lexicans, who are able to follow printed instructions. Mr. Chairman, nis is one of the most important things. He says that down in lexico, where they could not control a pest, they sent the instructions y mail, and the result was they destroyed them; yet in this country e are sending out men from here to show people how to do things. his situation exists not only with the reference to this department but vith every department. You are sending men all over this country or demonstration work when it is simple enough so that any man vith ordinary intelligence can follow the instructions. It looks to ne when you have a plan where anybody who can read is able to arry it out successfully it is folly to spend millions of dollars in ending men around to show how to do it.

The CHAIRMAN. Are there any further questions on that item?

We will now take up 28, pertaining to the migratory-bird law. There is an increase there, Doctor, of $50,940.

Mr. NELSON. I would like to explain, Mr. Chairman, that that ncrease is required from the fact that the present appropriation of 50,000 is totally inadequate to accomplish the purpose. We are upposed to enforce the migratory-bird law over the entire United States, and $50,000 gives us only 17 inspectors. Seventeen in-pectors go a very small way in covering the United States and pre-enting violations of the law. We have been bombarded by the itterest kind of criticism and complaint because we were not en-orcing that law.

Mr. HOWELL. How many adverse decisions have there been against he constitutionality of the law?

Mr. NELSON. The Shauver decision was the first one, and since hen there have been several more. Perhaps Dr. Palmer can tell ou more definitely about that.

Dr. PALMER. There have been two adverse decisions by the Federal Courts—one in the eastern district of Arkansas and one in the district of Kansas. There was an adverse decision by the Supreme Court of Maine last July, when the question of Sunday hunting was ujected, with the idea of setting aside the State law; and very recently vithin a few weeks, the Supreme Court of Kansas rendered an adverse ecision which was an outgrowth of the same case that was taken nto the United States district court of Kansas.

[illegible]

Mr. [illegible]. [illegible]

Mr. [illegible]. [illegible]

Mr. [illegible]. [

Mr. HAUGEN. That does not happen to apply to these cases, as I understand it.

The CHAIRMAN. Yes; the District Court of South Dakota held it unconstitutional. Did you not say that, Dr. Palmer?

Dr. PALMER. South Dakota has only one district court. Arkansas has two, the eastern district and the western district. Now, we had some cases in the western district of Arkansas and the judge dismissed some cases, and in other cases, where two or three pleas of guilty were entered, the courts let them off with nominal fines, then suspended sentence. It practically resulted in the western district following the eastern district.

The CHAIRMAN. What happened in South Dakota?

Dr. PALMER. A fine of $100 was imposed in one case and one or two cases were dismissed.

The CHAIRMAN. In this case in South Dakota the party pleaded guilty?

Dr. PALMER. The party pleaded guilty and the court filed no formal opinion.

Mr. HAUGEN. Then, so far as that court goes, the law has not been held to be unconstitutional.

That question is now for the Supreme Court to determine, of course. Who is prosecuting the case in the Supreme Court?

Mr. NELSON. The Department of Justice. It appears to me that the fact that one of the Federal courts has declared the law unconstitutional does not set aside or nullify the act of Congress until the Supreme Court has passed on the question.

Mr. HAUGEN. That is one way of construing it. Who is prosecuting the case in the Supreme Court?

Mr. NELSON. The case is being prosecuted by the Department of Justice.

Mr. RUBEY. The district court declared in a case that has been brought before it that the law is unconstitutional. That is given publicity—published in all the papers in that locality and in that part of the State. The people throughout that country are informed through such publicity that that law has been declared unconstitutional by the Federal court. Is it not a fact, then, that they will naturally go on considering the law as unconstitutional and you will have hundreds of cases, whereas you would not have had any, possibly, if it had been passed on the other way? And is it fair to go in and not prosecute these people, but gather evidence against them as long as that matter is pending in the courts?

Mr. NELSON. The fact is we have carried on a campaign of publicity; the announcement is sent to the newspapers that the law is still in force. We have had the same information published in the sporting magazines. The same information has been published in posters and in circulars by the department. In fact, pretty nearly all methods of publicity possible have been used. And, further, we have hundreds and hundreds of letters of inquiry from people, and we always reply promptly that the law is in force. So, as a matter of fact, the public is well informed as to the state of the case.

Mr. OVERMYER. Have you any idea how soon this decision may be reached in the Supreme Court?

Mr. NELSON. We are expecting it every Monday.

Mr. [illegible]. It is a matter of considerable importance. The [illegible]. The duck season closes at a certain date in the [illegible] on a earlier date, the State law providing for [illegible] law on a later date. All of the hunters in that [illegible] involved in this Federal migratory-bird law will [illegible] the decision of the Supreme Court.

Dr. Palmer. May I answer the question? The State of Ohio [illegible] the States in the Union to adopt the Federal [illegible] it did two years ago. Last year [illegible] season and made an open season [illegible] the 15th of March and running six weeks. [illegible] in process and will be in recess. I believe [illegible] will be no possibility of obtaining the decision [illegible] unless it is handed down on February 21 or [illegible] the duck season will open under the State law [illegible] Furthermore, even if we had the decision, it [illegible] to make a change this spring, as the law requires [illegible] before a change can be made.

Mr. Rogers. Mr. Secretary, for instance, what is the situation in Mississippi as to the Federal regulations and the State law?

Dr. Palmer. Mississippi has never altered her State law, which gives [illegible] to the 1st of May. Under the Federal regulations [illegible] to the 1st of February.

Mr. Rogers. What is that? The ducks do not nest or breed i Mississippi?

Dr. Palmer. Do you mean why was the regulation made at th [illegible]

Mr. Rogers. Yes.

Dr. Palmer. With the idea of giving a maximum amount of ti [illegible] in each State as far as possible to do so. No State h any shooting after the 1st of February under the present regulatio with the exception of three States in the South, which have t shortest season in the entire United States, and they close on the 15 of February.

Mr. Rogers. Do we not have the 15th of February in Texas?

Dr. Palmer. The 1st of February.

Mr. Rogers. As long as the decision of the court is pending and t Federal court has declared the law unconstitutional, people in t State acting under the State law, go out and kill ducks and are lia to prosecution if this law happens to be upheld. I think it is unf [illegible] when the Federal court has made its decision on the mat that they should be prosecuted, or even evidence collected again them, until the matter has been settled fully and finally by t Supreme Court.

Mr. McLaughlin. I gathered from what you said that there h been some cases in the State courts—Kansas, I believe. Has th been a conflict there between the State and Federal authorities. what was the status of the matter there?

Dr. Palmer. There was no conflict in this sense. Almost ev violation of the Federal migratory-bird law may also involve violati of some State law through the shooting of a migratory bird out [illegible] The men in Kansas were prosecuted in the State court shooting ducks from a motor boat in violation of the State law. [illegible] ted in the Federal court for shooting ducks out of season [illegible] of the Federal migratory-bird law. They may have s

e bird and yet have violated two or three separate provisions

ICLAUGHLIN. Is that in Kansas?
'ALMER. Yes. An individual shooting a duck, say, on the of February, and shooting without a license, has in his pos- a migratory game bird. That is a violation of the law. The at he shot the bird in the close season is a violation of the l law, and the act of shooting without a license is a violation ame law of the State.
ICLAUGHLIN. You were speaking of Kansas?
'ALMER. That is approximately the condition in Kansas in e.
ICLAUGHLIN. What was the result—the outcome of the ?
'ALMER. The decision in the United States district court was e Federal regulations of the Federal migratory-bird law were itutional, and of course the question was injected into the ase, and the Supreme Court of Kansas held that the Federal as unconstitutional. Both courts held the Federal law itutional.
OOLITTLE. What has been done with those cases; or at least leral cases? Have you appealed them?
'ALMER. No; there was no object in appealing the Kansas

OOLITTLE. Then, so far as Kansas is concerned, this Federal on is not unconstitutional if you have not appealed from that ?
'ALMER. The Supreme Court will settle the question not only ansas and Kansas but for every other State in the Union.
OOLITTLE. I was talking particularly about Kansas, where e not appealed.
'ALMER. We have not appealed, because exactly the same n was raised as in the Arkansas case.
TEELE. Do you not believe it would be wise not to make this iation, as long as this question is in abeyance? If it is l unconstitutional by the Supreme Court, what is the neces- this appropriation to continue an unconstitutional question?
ELSON. Of course, if a law is declared unconstitutional, then ill be no law to need an appropriation.
TEELE. It has been declared unconstitutional.
ELSON. Not by the Supreme Court of the United States.
TEELE. We understand that. It takes some time to get a before the Supreme Court.
ELSON. The Supreme Court heard that case on the 18th of . It has now had it over three months, and there certainly decision on it soon—perhaps immediately after the Supreme as recessed; and it will meet again on the 21st of the month. ision surely must come very soon, because they have had the long.
EILLY. Is it your idea, Doctor, that you can convict a man, for violating the migratory-bird law after a district court lared it unconstitutional, between that and the time the e Court passes on it?
ELSON. No; we are not bringing any prosecutions now.

Mr. [illegible] If you bring them afterwards you have an idea you can control.

Mr. NELSON. Yes, under the practice the fact of such a decision would not [illegible] nullify the law.

Mr. [illegible] I know but you have got to go before a jury. I think the money you spent gathering your information, if the Supreme Court decides in any unconstitutional, is all spent for nothing.

Mr. MCLAUGHLIN. Was that case from the Arkansas district court appealed to the circuit court of appeals or did it go directly to the Supreme Court of the United States.

Mr. [illegible]. It went directly to the Supreme Court of the United States on appeal from a demurrer.

Mr. NELSON. I should like to add here, in further reply to the question that was asked that while our men are gathering the evidence of violations these inspectors are at the same time carrying on a campaign of education. They find that when the need of this law is made plain the people have very commonly acquiesced in its necessity. In that way the law prevented a large number of violations; so that the money is not merely spent for getting evidence, but it is spent also for the educational campaign benefiting the general cause.

Mr. MCLAUGHLIN. I gather from what you say that the demurrer [illegible] was on the constitutionality of the law.

Mr. ANDERSON. Do you know the grounds of the demurrer?

Mr. [illegible]. The constitutionality of the law—that is the basic question and practically the only question.

Mr. HAUGEN. You said the people were upholding the law, etc. Of course the inspectors are unbiased witnesses; they are not interested in the law being enforced or the law being observed or anything of that sort?

Mr. NELSON. The inspector's testimony alone would not carry a case. It has to be supported by testimony of other people.

The CHAIRMAN. Take up the next item, if you please.

Mr. HAUGEN. I should like to ask a question or two.

Mr. HELGESEN. I should like to go back to the rodent pest for a minute.

Mr. HAUGEN. Before you go back to that let us finish this up first. The determination of the question largely depends on the department. I take it that the Department of Justice acts in accord with the instructions or suggestions made by the Department of Agriculture?

Mr. NELSON. The cases are carried through the Attorney General's office to the district courts, and there it will depend upon the action of the court and the jury in the locality where it originates.

Mr. HAUGEN. My understanding is that it depends largely upon the department back of it; that the Department of Justice acts simply in accordance with the instructions and suggestions made by the department back of the prosecution.

Mr. NELSON. The bare facts of the case are put up in regular form to the Department of Justice; then they act. There is no pressure brought or anything of that kind. We simply give them the facts of the violation, with the evidence, and they proceed to act.

Mr. RUBEY. Is it not a fact that the court or the Department of Justice acts in accordance with the suggestions made by the Department of Agriculture?

Mr. NELSON. In that way—that we furnish the information.
Mr. HAUGEN. So it is in the power of the department to suppress to expedite prosecutions?
Mr. NELSON. By suppressing them, which would not be discharging ır duty.
Mr. HAUGEN. If it is found by the Supreme Court that the law is ıconstitutional, the fines imposed, referred to as nominal fines, ɔuld amount to nothing less than a holdup. You would be fining ople or compelling people to pay fines under a law that did not exist?
Mr. NELSON. The law exists so far as the constitutionality——
Mr. HAUGEN (interposing). If it is declared unconstitutional by e higher court?
Dr. PALMER. That happens all the time. A case is tried and termined, but a later decision that the law is unconstitutional does ıt affect that case. That case is out of the way altogether.
Mr. HAUGEN. In what way? You hold a man for $500 and he ys it?
Mr. MCLAUGHLIN. Yes; and that disposes of the case.
Mr. HAUGEN. And if the courts hold the law to be unconstitutional, ı you claim, in justice, that he should have paid the $500?
Mr. MCLAUGHLIN. He has already paid it.
Mr. HAUGEN. Was it justly collected?
Mr. MCLAUGHLIN. It is disposed of and you can not go back and ke over all those other cases to pay back that man his money.
Mr. HAUGEN. Does anybody suggest that any department here ould go out and hold up people all through the country in the face a decision of a lower court?
Mr. MCLAUGHLIN. I presume this bureau and this department are ting in accordance with the opinion of their legal advisers, includ- g the officials of the Department of Justice itself, in this matter of llecting evidence of violations of the law, even in the State of ansas and the eastern district of Arkansas, pending the decision the Supreme Court of the United States as to the constitutionality that law. I presume the chief of this bureau is not acting on his vn responsibility; I presume that matter has been put up to him.
Mr. HAUGEN. I think somebody is responsible for it.
Mr. MCLAUGHLIN. It has been put up to him by the legal authority the Government.
Mr. NELSON. I think there is a misunderstanding. We are not stituting any prosecutions now. Since that declaration by the strict court we have been merely banking up cases and holding ıem in case the law is declared constitutional; but we are not getting ıybody fined or prosecuted at all.
Mr. STEELE. I agree with Mr. Rubey that you are imposing a hard- ıip upon the hunters of the country; that you are collecting this ıidence with the purpose, in case the Supreme Court holds it is gal, that you will go on and prosecute these people, when the court ɔw, as far as we know, has decided it is unconstitutional. I think ıat is a fair construction of the effect of this action upon the hunters this country.
Mr. NELSON. We are merely carrying out our duty as required by ıe law. We are not trying to impose extra hardships upon anyone.
Mr. HAUGEN. It was stated a few minutes ago that where nominal ıes were imposed they were paid. I have no knowledge of your

[illegible] have knowledge of some [illegible] the [illegible] power to make such [illegible] decided of the court [illegible] rules as to [illegible] Now, [illegible] the practice of this department [illegible] other department?

Mr. [illegible]. I have stated, that it is not the practice [illegible] because we are not instituting any prosecutions [illegible]

Mr. [illegible]. Not anywhere?

Mr. [illegible]. Not in the Legislative-bureau law.

Mr. [illegible]. But you are getting the evidence?

Mr. [illegible]. We are so as to be prepared in case the law is [illegible] That is our duty.

Mr. [illegible]. Your evidence, not, are unfair.

Mr. [illegible]. We [illegible] better to act on the suggestion of Mr. [illegible] the Supreme Court has determined whether [illegible]

Mr. [illegible]. What case? If the decision is sustained, [illegible] this department for not having secured [illegible] the suit was pending?

Mr. [illegible] might be criticized for not making appro-[illegible]

[illegible] I have is any criticism of the bureau at all, [illegible] proportionate share of that criticism. These [illegible] Palmer cases attention in Arkansas were [illegible] since these decisions appropria-[illegible] were passed by Congress, so that we are [illegible] and we can not [illegible]

Mr. [illegible]. I concur with and agree with the [illegible] was not criticising the depart-[illegible] making any question as to what was the practice of the [illegible]

[illegible] made to determine the merits of this [illegible] I never intended [illegible]

[illegible] It is well known that [illegible] when it [illegible] during the last [illegible] I am not opposed to the [illegible] but it is a thing for the State to [illegible] do not want to be understood [illegible] Congress has imposed.

[illegible] to have all of the records of this [illegible] Is there any change of this?

[illegible] The evidence of which the committee is [illegible] and also which you must determine to be [illegible] in those cases. We can spend this day [illegible] and [illegible] discussing statements before the committee.

Mr. McLAUGHLIN. If there is a question regarding this responsibility I we have some of the responsibility, would it not be well for us to w what authority has been consulted, what directions given, and at decisions reached by the legal officers of the Government?
The CHAIRMAN. Have you consulted the solicitor, Mr. Nelson?
Mr. NELSON. Yes, sir. Our actions in this matter are absolutely ded by the Department of Justice and the Solicitor of the De- tment of Agriculture. We are required to do what we are doing. ne of this is voluntary on our part.
The CHAIRMAN. We are sure of that.
Mr. McLAUGHLIN. Do those attorneys and solicitors whom you have sulted base their opinion and give you their directions to go ahead ause Congress has made this appropriation?
Mr. NELSON. No, sir; I think because it is the general manner of ducting matters of this kind. Where Congress passes a law it nds, even if its constitutionality is in question, until the Supreme rt declares it not a law.
Mr. ANDERSON. And you propose an increase in this migratory- d item?
Mr. NELSON. Yes, sir.
Mr. ANDERSON. I notice in your notes here you say $21,460 is for d expenses and equipment. Can you state a little more in detail at that is? That is on page 148.
Mr. NELSON. That item of $21,460 is largely for investigations. at is a matter that has been overlooked. In connection with the gratory waterfowl or game birds, it is a notorious fact that they ve decreased tremendously in the last few years through the exist- e of spring shooting and the invention of modern guns, the great rease in the number of hunters (thought to be over 5,000,000 in United States), and the use of automobiles. On account of all se things the birds are being exterminated. Through the occu- tion of their former haunts by farming and other uses of the land, ny of the best breeding places of waterfowl have been lost to them. For these reasons it seems necessary before it is too late to take ck and see what can be done to improve the conditions, in order prevent the extermination of our wild fowl. As a part of this work perts are sent to investigate the breeding places of the wild fowl learn the conditions there and what food plants are there. In nter we investigate the localities the birds frequent and learn con- ions and available food plants there. We are studying the food our wild fowl and already know many of their favorite food plants d their distribution. This information is valuable for the purpose advising the planting of valuable food species in new areas. Such ormation concerning the birds and their haunts can be secured ly by sending competent men to investigate the summer and winter mes of the birds. Last June we sent a man to the sand hills of braska, where he made a survey of the numerous lakes in this fine eding ground for wild fowl; then we sent him back in October to rn what the conditions were in the fall. We also sent a man there the fall to learn what food plants exist in those waters.
All this information we propose to publish, with recommendations making conditions there more attractive to wild fowl. We find t the sportsmen's organizations are very much interested in this se of our work. The owners of shooting preserves are applying

[illegible] as to the best methods of increasing the wild-[illegible] in their waters.

[illegible] of migratory birds is not only of value to individual sportsmen but is equally valuable to the State game commissions interested in increasing their game resources. I believe that we can very largely increase the abundance of the migratory fowl of this and largely increase the number of birds in what we might call the preservation [illegible].

Mr. [illegible]. I understand that this increase is to be [illegible] investigation as well as [illegible].

Mr. [illegible]. The item in this bill, I understood to refer to the $[illegible]. That amount is largely for field expenses and equipment.

Mr. [illegible]. Does it include the purchase of automobiles and motor boats?

Mr. [illegible]. No; not normally that kind. The purchase of equipment will be limited to instruments and the like for use in the field work and will not include any large items. The main outlay will be the salaries and traveling expenses of the men who carry on the work.

Mr. [illegible]. I notice here that $[illegible] of the additional $[illegible] is to be used for the salaries of additional investigators, wardens, and field assistants, and the $[illegible] for field expenses and equipment. What I want to find out is what are these field expenses and what equipment is now needed in addition.

Mr. Nelson. The equipment will include tents, camp-stoves, camp cooking utensils, and other things needed in the field work.

Mr. Anderson. Matters of traveling expenses.

Mr. Nelson. Yes, sir. As a matter of fact, $[illegible] would be the amount that is planned to spend in the investigations outlined.

Mr. Anderson. Then of this increase, $[illegible] ——

Mr. Nelson (interposing). Would go for, you might say, scientific investigation for purposes of bettering breeding conditions and increasing the number of wild fowl.

Mr. Anderson. And $40,000 is to be added to the general appropriation?

Mr. Nelson. To be used exactly as the present $[illegible] is used—in the general administration of the law. It is not proposed to buy anything in the way of automobiles or investment of that kind.

Mr. Rubey. I think the work you have just outlined as to the investigation is most excellent. But if within the next month or so, or before this committee acts, this law should be construed to be unconstitutional, where else in the appropriation bill is there any money that could be used for that purpose?

Mr. Nelson. There is no money. In case the migratory-bird law should be declared unconstitutional and the appropriation for it dropped it may be advisable to ask for an appropriation of $20,000 to continue these investigations.

Mr. Rubey. How much money is necessary to carry on that work?

Mr. Nelson. $20,000. It is a big subject. Men must be sent not only to various parts of the United States but to Canada, to Alaska, and to parts of Mexico where the birds are breeding or are wintering. We need a comprehensive knowledge of what we have left in the way of wild fowl and what we can do to preserve and increase them. They are disappearing rapidly, but by a little common-sense foresight

get information and take measures which will help very
ılly in perpetuating them.
Rubey. And you can do that with about $20,000?
Nelson. $20,000 will do a lot of work and give us much valu-
formation.
Howell. There seems to be some such work carried on under
.
Nelson. This work would be carried on mainly under item 27.
it would be under item 26—that part which relates to the
ations of the food plants—but the investigation of the areas
e wild fowl inhabit would be carried under biological investi-
.
Anderson. I should like to ask one more question, if I may.
ated just now that if the migratory-bird law was held to be
titutional you would want $20,000 for the investigation to
you refer. But you had previously stated that only $10,000
full amount asked for was to be expended——
Nelson (interposing). From the fact that if we have the
ppropriation we can get a large amount of the needed infor-
from the inspectors. We utilize the inspectors now.
Anderson. I assumed that was the situation. I wanted it to
in the record.
Helgesen. If you will turn to page 363 of the Program of
at the top of the page, you will find this:

orth Dakota Agricultural Experiment Station cooperates in a State-wide
ation of methods to control rodent pests and contributes $3,500 to this work.

uld like to know whether that $3,500 comes out of the funds
ropriated to your bureau or out of their own funds?
Nelson. That is their own fund.
Helgesen. The State experiment station?
Nelson. Yes, sir; under Director Cooper and Prof. Bell. It
y which they contribute to the work. The money we expend
mainly in salaries of men. This year we are arranging to
wo men there.
McLaughlin. They put up the money, but perhaps it is the
they receive from the Government—the regular appropria-
rough its experiment stations.
Nelson. I do not know where they get the money.
Helgesen. If that State would take $3,500 out of its regular
riation to carry on work of that kind, why is it that in almost
ther State the experiment stations refuse to do the work of
rt and expect the Federal Government, on account of these
appropriations, to go in and do the entire work at the Fed-
pense? I have contended all the time that, if you furnish
essary information, so that the State experiment stations can
ld of the work and do it, it is their business to do it, and the
e of supplying this country with a lot of demonstrators looks
ike an absurdity.
me ask you just this one other question. In the last para-
f that item you give the names of a large number of bulletins
u have issued. Are those bulletins written in such plain and
tandable language that an ordinarily intelligent citizen can
them?

[illegible]

Mr. HARRISON. [illegible]

[illegible]

Mr. HARRISON. [illegible]

[illegible]

Mr. [illegible]. We only learned that recently.

Mr. HARRISON. In our State the ground squirrel, [illegible] of the State, has been very destructive, but our State [illegible] to undertake to control the pest, and I think [illegible] to do it too.

Mr. [illegible]. We have only nine men doing the work.

Mr. HARRISON. I am not referring to the nine men, but those in the United States are doing that very thing, and I contend [illegible].

The CHAIRMAN. The demonstration matter will come more under the States Relations Service.

Mr. [illegible]. There is one difficulty, Mr. Chairman, that under States Relations Service and the county agent plan the county is supposed to be an expert in such a vast number of things that [illegible] to be difficult for one man in a county to get around and [illegible] that is expected of him, and I think the Government must help out with experts or else there is going to be a great falling off [illegible].

Mr. HARRISON. But this is not done, as I understand it. In [illegible] counties where there is no county agent the Federal Government assumes to do the whole thing. If the county will have a [illegible] agent of the cost of $[illegible], as in my county and in many other

in North Dakota, there is little need of Federal agents, and where
y do not have county agents and where they depend on the Fed-
l Government to do what they ought to do themselves, I think it
ntirely wrong.
Mr. NELSON. We have cases, as in Utah, in the Escalante Valley,
ere jack rabbits have completely destroyed the crops. We re-
ed a letter from there the other day that showed a deplorable
te of affairs. Dry-land farmers went into that beautiful valley—
agnificent farming country in which crops can be raised—and the
k rabbits came and cleaned them out. They even dug up the roots
l absolutely destroyed the plantings, in such a way that some of
men, men with small means, who had put everything they had
> their ranches, simply had to give up and leave the country
ed.
Mr. HOWELL. That condition exists in various other places, also,
s it not?
Mr. NELSON. Yes; in the West. We have men there trying to
w those people how to help themselves as much as they can. We
e done that in various places. These pests—jack rabbits, squir-
s, and others—often nearly ruin the poor settlers who go in and
to establish new communities. I think you are all aware of the
iculties the settlers encounter out in that new country, and when
se various pests get after the first crops it is pretty disheartening.
Mr. HOWELL. You not only are showing the farmers but all the
e are learning something yourselves?
Mr. NELSON. We are all the time improving the methods. Take
s jack-rabbit business; we have learned to poison them in several
ys, but no thoroughly satisfactory method is yet known; we are
ing to discover how best to do it so as to protect these people.
Mr. MCLAUGHLIN. Following the line of inquiry suggested by Mr.
lgesen, it seems to me, where you have completed the investiga-
n, learned the cause, learned the remedy, that any intelligent
rson ought to be able to apply it, and it becomes just a question of
ysical labor and expenditure of money; it is up to the local people
emselves, then, to do that work and furnish the money.
Mr. NELSON. On private lands. But one great trouble is that
ese people settle in the midst of an ocean of public lands. They
ve not money enough—no new community has money enough—
clean up the Government land in addition to their own.
Mr. MCLAUGHLIN. It is not a question of helping the poor. I do
t think it is a function of the Federal Government to help the poor
that way. I do not care how poor a man is or how wealthy he is,
you have solved a problem for him and your conclusion is such that
can take hold of it and apply the remedy, it becomes solely a ques-
n of the manner of doing the work and furnishing the money, and
that event I think the Government has gone as far as it ought to
and that the individual of the States ought to take up the work.
Mr. NELSON. That is no doubt true as to private lands, but of
rse that would not hold as to Federal lands. In the West you
ow there is a vast amount of Federal lands, and these Federal lands
ve as breeding places for the pests. A man protects his own land
l cleans out the prairie dogs, or whatever other animal pest is
re. That does not last two weeks before they begin to come in off
Government land and eat him up again.

Mr. HENRICKSEN. Assuming there were no public [illegible] I think the remedy stated by Mr. McLaughlin [illegible] control.

Mr. NELSON. I think that it is up to the people [illegible] look themselves effectively.

The CHAIRMAN. You may now take up item 24. [illegible] increase there of $5,000, which you say you want for [illegible] cooperative work.

Mr. NELSON. We are called on to cooperate with different Federal bureaus from time to time in work along our lines. We ask for this money to cover the salaries of men and their necessary [illegible]. We have been doing one piece of cooperative work this year with the Forest Service which is costing about this amount. In investigating the situation in the region about the Yellowstone Park trying to work out a plan for the conservation of the elk there and to provide for their future welfare. That means the salary of a man traveling [illegible] and so on. This increase is simply for that kind of work which will be needed next year, and there is no provision for it elsewhere in the estimates.

The CHAIRMAN. We are very much obliged to you.

Mr. NELSON. I might show you these two maps. The yellow is the [illegible] originally occupied by elk in the United States and the blue is the country that is now occupied by them. That map shows that they have been exterminated from most of the United States, but also [illegible] occupied the territory practically from the Atlantic to the Pacific. This other map shows where the elk have been introduced in the United States lately, the stock coming from the Yellowstone country. These red spots indicate the localities where the elk have been distributed or reintroduced in the old elk country.

Mr. [illegible]. Through your efforts and cooperation?

Mr. NELSON. Yes, in a large number of instances.

The CHAIRMAN. Those maps would be interesting if they could all be [illegible]. No man can remember everything shown by [illegible] who have been [illegible] before this committee, and perhaps a [illegible] number which I got on the floor of the House [illegible] long area of blue shows the location of the elk.

Mr. NELSON. I might [illegible] would be of interest to show the maps [illegible] as passing information.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Thursday, February 3, 1916.

ATEMENT OF MR. A. ZAPPONE, CHIEF OF THE DIVISION OF ACCOUNTS AND DISBURSEMENTS.

The CHAIRMAN. Gentlemen, we should like to take up the Division Accounts and Disbursements. Mr. Zappone is here. Looking er your division, it seems you have absolutely no change in it at all.
Mr. ANDERSON. You do not want any more money?
Mr. ZAPPONE. It may seem unique and remarkable, but it is a fact. ere is no change whatever in the appropriation for the Division of counts and Disbursements.
The CHAIRMAN. The work is of the same character as heretofore?
Mr. ZAPPONE. Identically the same character, and I hope to keep up with the same force.
The CHAIRMAN. Are there any questions, gentlemen?
Mr. ANDERSON. I think we ought to take a rising vote of thanks this proposition.
The CHAIRMAN. We all feel like thanking Mr. Zappone.

TATEMENT OF MR. JOSEPH A. ARNOLD, CHIEF OF THE DIVISION OF PUBLICATIONS.

The CHAIRMAN. The Division of Publications is a short subject ere. I think we can finish it in 10 minutes, if Mr. Arnold is ready.
Mr. ARNOLD. The Division of Publications is in almost the same ategory as the Division of Accounts and Disbursements; that is to ay, the aggregate increase asked for is only $2,580—$1,080 for alaries and $1,500 for general expenses.
The CHAIRMAN. In item No. 28 you have seven skilled laborers, t $840 each, decrease of one by transfer to statutory roll of Secretary's office.
Mr. ARNOLD. Yes, sir.
The CHAIRMAN. In item No. 31, you have 17 skilled laborers, at 720 each, decrease of 1 by transfer to statutory roll of Secretary's ffice, and 2 new places, making a net increase of 1. You need 1 ore person there for what purpose?
Mr. ARNOLD. We are really asking in that particular item for two dditional skilled laborers, at $720 each. Their services are urgently eeded in the work of addressing envelopes, duplicating, folding, toring, stacking, and mailing circulars, etc. The force we have is bsolutely insufficient—is not adequate, at any rate—to take care of

the enormous amount of work that devolves upon it; so we are asking for two additional laborers, at $720.

The CHAIRMAN. It says only one.

Mr ARNOLD. It is in reality two. Sixteen are now carried on the roll of this division. One of them is now on detail to the Secretary's office and provision has been made for his transfer to the statutory roll of that office. That would leave us 15, and the 2 asked for makes 17—an increase of 2 skilled laborers.

The CHAIRMAN. On page 160, item 43, you have two laborers at $600 each, by transfer from lump fund for extra labor of Secretary's office, which fund has not been correspondingly reduced. Did you decrease the lump fund by that amount or not?

Mr. ARNOLD. No, sir.

The CHAIRMAN. Why not?

Mr. ARNOLD. That I can not answer. That relates to the lump fund of the Secretary's office.

The CHAIRMAN. Let Mr. Harrison make a statement in the record.

Mr. HARRISON. These two men are now carried on the lump fund of the Secretary's office, but are detailed to the Division of Publications. The lump fund has not been reduced. The reasons will be given when the Secretary's roll is discussed.

Mr. REILLY. In item 39 you have two messenger boys at $480 each. What do those boys do? Are they engaged in the place where you do the publication work of the department?

Mr. ARNOLD. Some of these messenger boys are employed in what we call our machine room, where all the duplicating of circulars of information, orders, and so forth is done, such as are required for immediate use. One of them at $480 and three others are working in that room. Now, as a matter of fact, I do not hestiate to say that they are not getting enough money for that work.

Mr. REILLY. I was going to suggest that those men are not boys any longer—they are men.

Mr. ARNOLD. They are handicapped because of their peculiar civil-service status. They can not go beyond $480, nor are they permitted to take an examination for promotion. They are absolutely blocked, and many of those young fellows are doing the same work that other men are doing who receive $780, $840, and even $900 a year, and doing it well; but these men can never be paid more than $480, except by legislative enactment, owing to their peculiar civil-service status.

Mr. MCLAUGHLIN. They can take another examination to make them eligible, can they not?

Mr. ARNOLD. I think they can never take another examination because all of them happen to be from the District of Columbia.

The CHAIRMAN. I had a case myself of a young man I wanted to help. He was in this category, and there was nothing to be done.

Mr. REILLY. If these boys are men and doing men's work, why are they not transferred to the roll where they will get men's pay?

Mr. MCLAUGHLIN. He has answered you. They are not eligible under civil-service law.

Mr. ARNOLD. If there were specific places at higher salaries, these young men could be appointed to them. It should be borne in mind, however, that a similar condition exists throughout the department and, I understand, in other departments as well.

Mr. HAUGEN. What salary is paid to messenger boys in the epartments?

Mr. ARNOLD. It runs all the way from $300 to $600.

Mr. HAUGEN. Then, if you fix the salary of these at $720, practially all the rest of them have the right to insist that their salary ould be increased to $720.

Mr. ARNOLD. They would if they were doing as high a grade of ork as these men are doing.

The CHAIRMAN. These cases may be exceptions, but it is a hard atter to write laws to fit exceptions, you know.

Mr. ARNOLD. It is. Let me explain that on September 18, 1909, e President, upon the recommendation of the Civil Service Comission, amended the civil-service rules, removing the position of essenger boy from the apportioned service and providing that the xamination be held at Washington, D. C. Under this order no essenger boys that have been appointed since September 18, 1909, an be promoted to more than $480 per annum and can not take xamination for promotion to apportioned positions whether they re residents of States or Territories which are entitled to appointents to apportioned positions or not.

Mr. MCLAUGHLIN. The trouble is that so many of these people ve in the District of Columbia, and if a man brings up a family in he District of Columbia with a litter of children——

The CHAIRMAN. I object to that word "litter."

Mr. MCLAUGHLIN. Well—an elegant large family. The effort is metimes made to get them all into the classified service. If they ere all admitted into all classes of employment, the feature of the vil-service law which provides for allotments to the different States ould be abrogated altogether.

Mr. HAWLEY. It is very largely impaired now.

Mr. HAUGEN. These people could be taken care of by Executive rder, could they not?

Mr. ARNOLD. Yes, sir. The only thing that can be done now is to o and reside in some State for a year, take the examination there, nd be certified from that State.

Mr. HOWELL. Will you explain briefly how farmers' bulletins are ublished and how republished? I mean how they are ordered ublished.

Mr. REILLY. The reason I brought this up is that there are workg in that division which Mr. Arnold spoke of, I think, a couple of o-called messengers for $600 a year apiece, and I believe they are) or 21 years of age. They have grown up there and become profient in the work as the work has grown—one being a messenger at 480 and one at $420. My contention is that if the Government ants men for work it ought to pay them or get them out of there. he Government of the United States should not have any men 18,), or 21 years of age working as boys.

Mr. ARNOLD. They are earning more than they are receiving.

Mr. REILLY. I understand they are very proficient, that the work f that division has grown enormously, and that these men started om childhood and have now reached their limit.

Mr. MCLAUGHLIN. Are they doing any more work or doing it better an they did as children?

Mr. ARNOLD. I think so. They started in as mere messenger boys to run errands and they have now been assigned to more important work, including clerical work and the operation of duplicating machines.

Mr. HELGESEN. Do they use a typewriter?

Mr. ARNOLD. Yes, sir; some of them do. We encourage them all to improve.

Mr. DOOLITTLE. I do not want to criticise the work down there, but there was considerable criticism last year about the individual letters received by Members of Congress.

Mr. ARNOLD. I remember that.

Mr. HELGESEN. In response to requests for sending out of bulletins which were received. The contention was on the floor of the House that a circular letter could be made up down there and through that means acknowledge receipt of an order instead of preparing individual typewritten letter in each instance.

Mr. ARNOLD. I think the suggestion was also made at that time that we do away with the writing of many of the letters entirely—to simply act on the requests and not advise Members of the action that had been taken. That is a matter to which we have given a good deal of consideration. Our object in that respect has been to satisfy the Senators and Representatives, and most of them, I am free to say—and I have talked with most of them—prefer to have a special letter with regard to each request as a matter of record. I think there are only two Members in the House to-day who have told me that we need not bother about writing them a letter; in those particular cases we do not, but in all the others we have always thought it was a courtesy to the Member or to the Senator to give him a letter telling him just what had been done in regard to his request.

Mr. ANDERSON. I got the impression somewhere that where no letters accompanied the franks from the Members, in that instance you did not reply by letter.

Mr. ARNOLD. That is by arrangement oftentimes with the Member himself. Some of the Members insist when they send down a batch of franks, if the list is not too long, that we shall enumerate the names covered by the franks, or, if the number is large, that we state the number of addressed franks we have received and the action taken. Our object has simply been to act in that respect in accordance with the wishes of the Senators and Members.

The CHAIRMAN. I presume you do whatever any other business house would do under the circumstances—when you get a letter you acknowledge receipt of it?

Mr. ARNOLD. We certainly do.

The CHAIRMAN. That is the proper way.

Mr. ARNOLD. I think it is a courtesy due to the Senators and Members.

The CHAIRMAN. It is done by every department, I take it, and if a Member wrote to the Secretary of War and did not get a reply he would think it strange, and the farmers' bulletins are just as important to some folks in the country as a letter from the Secretary of War.

Mr. ARNOLD. That is the view we have always taken. Of course, it involves considerable work.

Mr. HAUGEN. What is the expense?

Mr. ARNOLD. I never figured it out. Letters to Members of Congress and Senators average 300 or 400 a day.

Mr. OVERMYER. Could you not use a form letter?

Mr. ARNOLD. We have thought of doing that, but it would take several form letters. As a matter of fact, it would be difficult to devise a suitable form letter for general use. The congressional letters generally are routine letters, as we call them, and the clerks are familiar with them, and after receiving the necessary information they write the letters, following the regular form.

Mr. HAUGEN. How many people are employed in that work and about what is the expense?

Mr. ARNOLD. We have possibly seven or eight stenographers engaged in that work.

Mr. HAUGEN. And they are paid how much?

Mr. ARNOLD. They are paid an average of $900 a year.

Mr. HAUGEN. Ten would be $9,000 a year?

Mr. ARNOLD. Something like that—about $7,500 for the eight. Of course, you understand they do not write congressional letters exclusively. There is a good deal of miscellaneous correspondence aside from this which has to be taken care of. The correspondence with the division averages all the way from 2,500 to 4,000 letters a day.

Mr. REILLY. It comes from all parts of the country?

Mr. ARNOLD. It comes from all parts of the country on every conceivable subject, and a good many letters require answers which necessitate the expenditure of considerable time and energy.

The CHAIRMAN. You ask for $1,000 increase in item 47 and $500 in item 48. Briefly tell us why you need those increases.

Mr. ARNOLD. That increases of $1,000 is for labor-saving machinery and supplies. As I explained, we have a machine room where the emergency orders for circulars, for information, and material for the press is prepared, and about 20 employees are engaged there. We have stencil-cutting machines and addressing machines, and the situation is that we have not had any appropriation with which to buy new machinery, nor have we sufficient funds now to replace the old machines or even to buy worn-out parts. On that account we have asked for $1,000.

The CHAIRMAN. It is worn-out machinery simply that you want to replace?

Mr. ARNOLD. Yes, sir.

The CHAIRMAN. What about this $500 for envelopes and stationery?

Mr. ARNOLD. That is necessary to enable us to buy additional envelopes and paper. We use a good many envelopes in connection with the foreign distribution. Of course, you understand the bulk of our envelopes, for instance, in the congressional distribution of farmers' bulletins, is furnished by the Public Printer, but this is for departmental use—the things we mail, the circulars of information, thousands, even millions, of which are sent out all over the country. We furnish the envelopes in such cases.

Mr. OVERMYER. You do not print any of these farmers' bulletins?

Mr. ARNOLD. They are all printed in the Government Printing Office.

Mr. OVERMYER. On your orders?

Mr. ARNOLD. Yes, sir.

Mr. OVERMYER. You determine how many?

Secretary has the authority to order
circular?

limit of your appropriation?

limit of our appropriation.

general statement with regard to the
read it very briefly or, if you prefer I
with the committee.

objection it will be inserted in the record

follows:

THE PUBLICATION WORK OF THE DEPARTMENT OF AGRICULTURE.

and binding for the Department of Agriculture for
the present year is $500,000. This amount is appropriated to
which is authorized to execute orders for printing and binding up
Item is carried in the sundry civil appropria-

work of the department it may be stated that on
was adopted, constituting a radical change in the character
Prior to that time there were a series of bulle
in each bureau, division, and office. On the date men
and the popular and semitechnical matter heretofor
has since been published in the new department
beginning with No. 1. The principal object of the new classific
was to draw the line more sharply between the strictly scientific and popul
of the department, so as to prevent the waste arising from the misc
distribution of the scientific bulletins and to make a wider and wiser d
of the popular bulletins. Under the new classification, the confusion whi
the result of the numerous series of bulletins and circulars has be
and a new and improved form of publication has been adopted, by whi
unnecessary preliminary matter is omitted from the bulletins, resulting in a c
saving of expense.

Generally speaking, the publications of the department may be classified as follo

1. *Farmers' Bulletins.* These are printed under a special authorization of law,
appropriation being $137,500, and four-fifths of all that the department is able
secure with this appropriation are distributed upon the orders of Senators, Rep
sentatives, and Delegates in Congress. As the title indicates, these bulletins are
distribution to farmers. They are written in plain language and are adapted to
different sections of the country, their specific object being to tell the farmer how
when to do things. During the last year 77 new bulletins were issued, of wh
5,870,000 copies were printed, while reprints of 243 of the earlier numbers of t
bulletins were ordered, the number of copies aggregating 8,925,000, or a total num
of all farmers' bulletins during the year of 14,795,000. These bulletins are
tinuously kept in stock as long as suitable for distribution and can generally be
tained by application. A special effort is now being made to further improve
series by the preparation of bulletins upon subjects on which there is no publis
information.

2. *Department bulletins.* About 250 of these bulletins have been issued. They
with subjects of interest to such classes as fruit growers, truck growers, lumbern
poultrymen, etc. They are intended for men who are specialists, actively engag
in various industries, and who, while not technical men, or more or less professi
and can be spoken of as professional workers.

It was found necessary to establish in this series what are known as Professi
Papers, in which information on highly technical subjects can be communicate
scientists or technologists in the same or allied fields of inquiry. The departm
bulletins are issued in editions averaging 6,000 copies and are distributed fre
miscellaneous applicants as long as the supply lasts. After that, applicants ar
ferred to the Superintendent of Documents, Government Printing Office, wh
authorized to sell them under a provision of the law of January 12, 1895. Their
tribution is, therefore, indefinitely continued after the department is unable
account of lack of funds, to make further distribution of them.

publications.—These include:
rnal of Agricultural Research, in which the purely scientific and technical
printed. The Journal is issued weekly and is distributed free to the libra-
icultural colleges and experiment stations, large universities, technical
id such institutions as make suitable exchange with the department. It
free to individuals.
eriment Station Record. This is a technical review of the world's scientific
pertaining to agriculture, with special reference to the publications of the
riment stations. It is not intended for general distribution, and its free
n is restricted to persons connected with the agriuclture colleges, experi-
ons, and similar institutions, and to libraries and exchanges.
kly News Letter, which is designed for distribution to crop correspondents
yees of the department, and other agencies which cooperate with it, con-
of the important current activities of the department and directions for
rement of farm practice. It is not for miscellaneous distribution.
thly Crop Report. This contains data relative to agriculture, including
of acreage, conditions, yields, prices, and value of crops and live stock.
buted to all persons interested sufficiently to apply for it.
thly List of Publications. This is issued on the last of each month, giving
cription of each publication issued during the month and an indication of
of the country to which it is adapted. It is by means of this list that mis-
applicants are enabled to keep in touch with the department and to apply
ublications in which they are interested. It is sent to all who desire to

essional publications.—These comprise those publications that are required
provision of law to be printed. They comprise the Yearbook, of which
ies are issued, 470,000 being for the use of Senators, Representatives, and
n Congress, 30,000 being allotted to the department, which are distributed
tary agents and crop correspondents.
erations of the Bureau of Soils, including the annual report and advance
are issued as soon as prepared. Allotments are by law made to Senators,
tives, and Delegates in Congress, only 1,000 copies of each report being
the department for distribution.
Reports of the Secretary of Agriculture and of the chiefs of the various
ivisions, and offices. These are designed principally for the information
rather than for general distribution.
ort of the Chief of the Weather Bureau and the Report of the Office of
t Stations, of each of which there is a congressional allotment.
llaneous.—It is necessary to print a considerable number of circulars of
, directions, food-inspection decisions, notices of judgment, and other
tive orders, etc. These are not regarded as publications or listed as such.
n to these, there are separates from various publications, unnumbered
, etc.
ter of information, it may be stated that the publication work of the depart-
ade known to the people—
ugh press notices and summaries of bulletins prepared in the Office of In-
and distributed to newspapers throughout the country.
ugh the medium of the Monthly List of Publications, of which 180,000 copies
monthly and distributed to all who apply for it.
ugh the very wide distribution of lists of Farmers' Bulletins by Senators,
tives, and Delegates in Congress.
neans of lists of publications that are regularly published in numerous
in various sections of the country.
neans of the lists of publications issued by the superintendent of docu-
widely distributed.
ing the demand for the department's publications, it may be stated that
to 4,000 letters are daily received by the Division of Publications, asking
tions of various kinds. As a matter of fact, the demand for our publica-
in excess of the department's ability to supply.
l number of copies of bulletins, reports, and documents of every descrip-
during the past year was 36,075,561.

HAIRMAN. Is there any further statement you wish to make?
RNOLD. I think not.
HAIRMAN. We are much obliged to you.
upon, at 12.30 o'clock p. m., recess was taken until 3 o'clock

HOUSE OF REPRESENTATIVES
COMMITTEE ON AGRICULTURE.
Thursday, February [illegible]

AFTER RECESS.

The Committee reassembled at 3 o'clock p. m.

The CHAIRMAN. Gentlemen, we will take up the Bureau of Crop Estimates, on page 167 of the Book of Estimates, and we will ask Mr. Estabrook to discuss that for us.

STATEMENT OF MR. LEON M. ESTABROOK, CHIEF OF THE BUREAU OF CROP ESTIMATES.

The CHAIRMAN. Mr. Estabrook, I see in item 5 of your statement, you have an increase of one clerk, class 2, submitted. Will you tell us about that, please, sir?

Mr. ESTABROOK. I think we might take all those three items together, they are all the same thing.

The CHAIRMAN. You mean items 5, 8, and 9?

Mr. ESTABROOK. Yes, sir. That involves an increase of six clerks, one at $1,400, two at $1,000 each, and three at $900 each. The increases are necessary because the work of the bureau is constantly increasing, it is growing year by year, and we have had no increase in the clerical force for several years.

Mr. HAUGEN. Are these employees in your bureau now?

Mr. ESTABROOK. No, sir; these are straight increases.

Mr. HAUGEN. Several bureaus have asked for increases by transfer from the lump funds this year. These are not such transfers?

Mr. ESTABROOK. No, sir. This contemplates new clerks next year. Besides the fact that there has been an increase in the work with a corresponding increase in the clerical force, another element enters into this matter, and that is the decreased efficiency of some of the older clerks, some of whom have been in the service for more than a quarter of a century. Our bureau is one of the oldest in the department, as it was one of the first divisions of the department when it was created in 1862. Some of the clerks who were in it when it was organized are still there. Of course, as they get advanced in years it is impossible for them to keep up to the same standard that they maintained when they were at their maximum efficiency. We have had no increase in several years, although the work has more than doubled in the last 10 years, and the efficiency of some of the older clerks has decreased, and we feel that it is imp

tively necessary that this small increase be allowed. We really need 10 or 20 more clerks in our bureau now, but in the interest of economy we have cut the estimate down to the very bottom, and we are asking for the very least number that we can get along with and handle the work in a satisfactory manner.

The CHAIRMAN. Any questions on those items, gentlemen? If not, that completes your statutory roll, and we will turn to page 163 and take up the general-expense items for the Bureau of Crop estimates. Item 17, salaries and employment of labor in the city of Washington and elsewhere, $24,700.

Mr. ESTABROOK. There is no increase in that item.

The CHAIRMAN. The item expresses what is done under it?

Mr. ESTABROOK. Yes, sir.

The CHAIRMAN. Any question on that, gentlemen? If not, take up item 18, for salaries, travel and other expenses of employees out of the city of Washington engaged in field investigations, $168,856. There seems to be an increase asked for there of $26,856 Will you tell us about the necessity for that?

Mr. ESTABROOK. That increase of $26,856 is made up of three elements. We are asking for an increase of eight new field agents, whose salaries make up the greater part of that increase. Three of these we want for the States of Texas, California, and New Mexico.

As it is now we have only one field agent to take care of Arizona and New Mexico. That territory is too large for any one man to handle, and we want an additional field agent to take charge of one of those States. It will cost $1,608 for his salary and about $1,500 for traveling expenses.

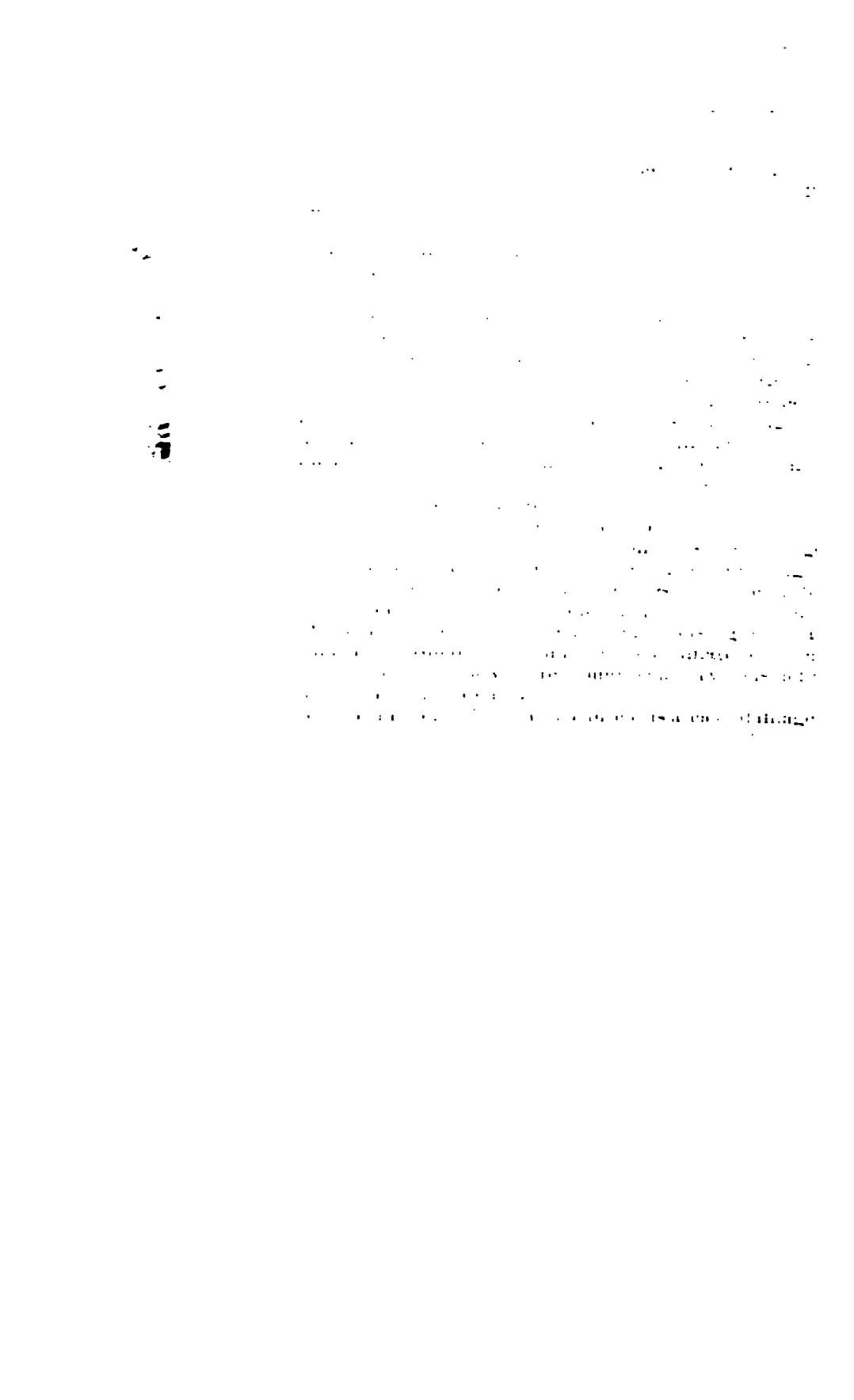
Texas is the largest State in the Union, having nearly 10 per cent of the total land area of the United States, and yet our work there is in charge of only one man. It is too large for him to handle. He can not possibly cover it adequately, and therefore we think we should have another man in the great State of Texas.

For practically the same reasons an additional man is needed in California, because of its great extent of territory and great diversity of crops.

So that accounts for the three new field agents we have asked for.

Then, we are asking for two truck-crop specialists. We now have but one man assigned to that work. The truck crops are growing in importance every year, and they are becoming of great value. At the present time the truck crops are twice as valuable as the tobacco crop in the United States. One man can not do more than organize the work and hit the high places. We need at least two additional men in order to enable us to get out into new regions and get in touch with the work.

Mr. ANDERSON. Before you pass that item, I notice that the Office of Markets and Rural Organization is asking for an appropriation of $136,600 under an item which reads like this: "For collecting and distributing, by telegraph, mail, and otherwise, timely information on the supply, commercial movement, disposition, and market prices of fruits and vegetables." It would seem to me that that item covers everything that could be covered by this small item of $5,000 included in the increase you have asked for and that there would be a duplication of work there.



by these unfavorable conditions, our crop reporters allowed conditions by decreasing the estimate of the yield per acre; for the entire country our estimates continued to increase. nate of damage is shown in the estimate of quality, which is the poorest in 20 or 30 years. In the Monthly Crop Report to emphasize and bring out and rub in the fact that the dam- to those unfavorable conditions is shown in the decreased on per acre and in the exceedingly low percentage of quality.

AWLEY. I don't think you quite got my question. Maybe I make it clear. Was the actual corn crop larger or smaller r bureau anticipated?

TABROOK. We can not say that it is larger or smaller, because nows any better than we do, or as well, what the actual num- shels produced was.

AWLEY. That is why I asked you.

TABROOK. We feel that our estimates, as published, and not d in the newspapers, are fairly accurate.

BEY. How much corn was produced in 1915?

TABROOK. Three billion and fifty-five million bushels.

BEY. How much corn did you estimate would be raised?

TABROOK. That is our estimate.

BEY. What I am trying to get at is this: Do you know ow much corn was produced in 1915?

TABROOK. No, sir. No one knows that.

ILLY. That is one thing that nobody knows.

AWLEY. You know how much has been brought to market?

TABROOK. Yes, sir; we have an estimate on that.

AWLEY. How much is used by the farmers for their own pur-

TABROOK. In the usual year it is about 80 per cent. About h is kept on the farm for home use. Only about 20 per cent to the commercial channels.

DERSON. So there is no way to tell whether your guess is an what anyone else might make?

TABROOK. No, sir; except in the census year.

DERSON. I saw a statement in the paper the other day that ng people estimated that the crop of milling wheat was 00 bushels less than your estimates. Do you know anything at?

TABROOK. I know that our estimate of the winter wheat crop questioned, but we feel pretty sure that we are right on that. ate was reduced somewhat after the condition reports came he estimated yield at harvest was reduced. There was a e increase in the acreage planted to wheat last year, and conditions were exceptionally favorable up to harvest time. ne this unusually wet summer, which caught a lot of the heat in the shock and caused a great deal of it to be discolored rwise damaged. There was a great deal of criticism at that he bureau's estimate because of the condition of the wheat lds, and for that reason we felt that possibly there might n an overestimate there. So in August we repeated our in- d asked our reporters to again estimate the yield per acre. assed the winter wheat belt very thoroughly, and that can-

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Mr. ESTABROOK. I think our average deviation would be from 2½ to 3 per cent. So, taking that as an index, we believe we come pretty close to the final results.

Now, going back to the question with reference to estimating the wheat crop, we have been criticised for not estimating the quantity of the 1915 wheat crop which was of a millable quality. Our answer to that is that no one knows and that no one is competent to say just how much wheat there was last year of a millable quality. The elevator men did not know, the millers did not know, and certainly the farmers did not know, and they do not know yet.

Mr. ANDERSON. No one could tell until it got in the market anyway.

Mr. ESTABROOK. As a matter of fact, reports from many different sources indicate that a very large percentage of the damaged wheat, an exceedingly large percentage, has gone to the mills and been made into flour for export. They were able to handle it with their new machinery and methods.

Mr. HELGESEN. When you say "millable" you must mean but an extremely small amount. There may be different qualities of wheat, but there must be a very small amount that does not go to the mill; it is not being used for feed?

Mr. ESTABROOK. Yes, sir.

The CHAIRMAN. Any further questions? If not, take up your other increase, under (c), $3,216 for two truck specialists, etc.

Mr. ESTABROOK. Those truck specialists I have spoken of. We need these men very much, as we now have but one man on this large group of valuable crops, on which it is highly important to get definite information. There is a constant tendency in the growing of truck crops to overdo the business in certain localities and in some seasons, and this results in great financial loss. If our bureau can estimate accurately year after year the acreage planted and the probable production, taken in connection with the reports of the amount in storage, it will be of great advantage to the truckers in marketing their crops and some sort of a guide as to whether it will pay them to increase or decrease their plantings. Last year we reported in the early part of the season that there was an unusually large quantity of Irish potatoes in storage. We ventured to point out in the Monthly Crop Reporter that if the truckers should grow potatoes on the eastern shore of Maryland and down the coast they would come into competition with storage potatoes, and that they had best be careful about the acreage they put in. Many of them disregarded this warning, with the result that they could not sell their potatoes. This year conditions are just the reverse. There is a much smaller quantity in storage, and I imagine those growers will pay some attention to the present report as a result of their experience last year. All that would apply to many of the truck crops.

Mr. HELGESEN. How far west do the eastern growers ship their Irish potatoes? Are they limited in that respect on account of the freight rates?

Mr. ESTABROOK. I could not answer that offhand. Potatoes are very bulky and heavy, and the result is that they do not ordinarily travel very far unless there is absolute necessity for it; also for that reason there are not many potatoes exported or imported.

The CHAIRMAN. Any other questions on that point, gentlemen?

[illegible]

[illegible]

[illegible]

n no case in excess of $4 a day for subsistence; but where travel erformed on an actual expense basis a limit of $5 a day is fixed aw.

r. HELGESEN. But some one has made the statement here—
not remember now who it was—that sometimes one of your men els with one or more assistants and that the high-priced man is wed more for his hotel bills than the lower-priced man, although y may stop at the same hotel. Is that the case?

Ir. ESTABROOK. That has happened in the past, but I do not think extensive at the present time. The many difficulties that would lt from such a system are apparent, and I believe it was pretty eliminated a year or so ago.

[r. HELGESEN. I don't see why that should be, unless the man's ry is based on his appetite.

r. STEELE. What kind of professional man have you that wants top at a $5-a-day hotel?

r. ESTABROOK. There are some places where you can not get thing under $5 a day.

r. HELGESEN. Where?

r. ESTABROOK. At Riverside, Cal., for instance. My recollection at there are only one or two hotels there, and I think they charge $4 to $6 a day for a room alone, and you have to use the balance e $5 to get something to eat.

r. ANDERSON. As I remember it, the commission on economy efficiency went over this entire question of traveling expenses reformed the methods in use in some of the departments, one of h, I think, was the Department of Agriculture. Do you remember about that?

r. ESTABROOK. I remember that commission did a great deal of k in our department. As a matter of fact, the Department of iculture has had this subject under constant consideration for the 10 years. We have had a special committee for many years that iders these matters as they come up, some of them almost every th. We have a fine set of fiscal regulations which are rigidly rced.

r. HELGESEN. Why wouldn't it be best to do as most of the manturers and jobbing concerns in the country do with their traveling on the road? They require them to produce an itemized bill, receipts, showing their actual expenses.

r. ESTABROOK. Of course, it could be done for all expenses, but question always arises whether it is worth while. Whenever you any detail in the machinery of carrying on the work of the dement you are adding to the expense. You would have to have tional auditors, not only in our department but in the Treasury artment. Every additional item you put in there to be checked s more time, and it is a question whether such a procedure ld not cost you 10 per cent more in salaries of extra or additional s and auditors than could be saved.

r. HELGESEN. Then, you think all commercial concerns are going bad to worse in this respect? I asked a jobber about this rely, suggesting that he ought to allow a traveling man so much a , by taking an average of what it had been, and he said that he having to do business on such a close margin of profit that he

[illegible]

Mr. [illegible]. [illegible]

Mr. [illegible]. [illegible]

Mr. [illegible]. [

The CHAIRMAN. So you have a double check, one in the Agricul-ral Department and in the Treasury Department also?
Mr. ESTABROOK. Yes, sir.
Mr. STEELE. In checking up these accounts in your department, of e men who are traveling around from place to place, you may ow that he has visited towns where there are hotels that charge $2 lay for a comfortable home and others that charge $5 a day. Do ey find that these men generally locate in the $5-a-day places? es the auditor who examines the account inform you that this low, for instance, seems to like those $5-a-day hotels better than e $2 hotels?
Mr. ESTABROOK. There are possibly some items of that character at might get through. I have no doubt some of them do. But have experienced auditing clerks in the department who are diting such accounts from month to month, and they are also diting accounts of a number of different men, some of them going the same town. They have hotel directories to which they refer; ey compare the accounts of the different travelers; and thus they pretty familiar with the rates at these various stopping places. is the practice of our department to economize and keep the veling men down to a reasonable limit. That is one purpose of administrative examination of accounts, namely, to keep the vel expenses of the department on a strictly economical basis.
Mr. STEELE. You could standardize per diem expense accounts, uld you not?
Mr. ESTABROOK. That has been done to a certain extent in some the bureaus. In the Bureau of Crop Estimates we have a per m allowance of $4 a day, and the accounts are checked up and hecked to see how they compare with the expenses of the same n on an actual expense basis. The allowance covers only sub-tence, lodging, meals, waiters' fees, etc.
Mr. STEELE. What is your average per diem cost for railroad penses and for hotel bills, and all that sort of thing?
Mr. ESTABROOK. The railroad expenses are not on a per diem basis.
Mr. STEELE. I mean what is your average; what is the average per y for his entire expenses?
Mr. ESTABROOK. Probably about $10 a day; I should imagine that uld be a fair estimate for railway fare and his subsistence and hotel ls while traveling.
Mr. HELGESEN. As a matter of fact, haven't the wholesale houses ured down their expenses per day for traveling men to about $6?
Mr. ESTABROOK. It would depend a good deal upon the way you veled, the territory covered, and whether much of the time was nt in large cities. I suspect that $6 a day would probably cover bsistence only, and not transportation.
Mr. STEELE. You understand that a traveling man has to make tain territory; he dodges about from one place to another, doubling ck, using a freight train or any kind of a conveyance; he dodges out a good deal faster than your man, and ought to make a little re expense. But as I understand it, their daily average is but $5 lay for all their expenses; it may be $6 now, though.
Mr. ESTABROOK. This average I speak of is simply an offhand state-nt. My impression is that our field men, not only of our bureau

[illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

The CHAIRMAN. Which is perhaps the most [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr.

each year was enough. In 1914 that condition in all States was nged and this committee gave us an increase in the appropriation, h which we were able to appoint a field agent in each State, or up of States, who was a trained man, in the classified service, a n who was trained in statistical methods and in the judging of ps. Each one of these men is compiling information for the eau in his particular State, and under instructions from the eau he goes out and travels for three weeks every month during crop season and is able to cover the entire State and visit every portant section in his State. He sees the crops with his own eyes has a chance to interview people on the subject. A man can estimate crops at a desk or in an office. He has got to get out, the more active he is in getting around over his territory the bet- results we get. So that in order to get more efficient service we justified in spending more for necessary travel.

Mr. HELGESEN. Does he go to each locality only one time in the p season?

Mr. ESTABROOK. Once each month.

Mr. ANDERSON. The point I was getting at was this: In 1915, when spent $166,000 altogether, you spent $52,000 for traveling expen- This next year, when you spent or expect to spend $193,000 for ir entire bureau, you expect to spend $73,000 for traveling expen- Without additional inspectors, apparently, and with no addi- nal appropriation, I can not understand why there is such a large rease in the amount of the traveling expenses?

Mr. ESTABROOK. It is because the first year our system went into ect we had estimated for only sufficient funds to allow our new nts——

Mr. ANDERSON (interrupting). But this does not go back that far.

Mr. ESTABROOK. I think the committee in their desire to economize off $20,000 from our estimates for the fiscal year 1915. Due to the bable shortage of funds, we were compelled to hold our men at their tions part of the time. This year we are trying to remedy that. course, we can get along without sending these agents out; we can d them at their stations; but it is a waste of good money to pay aries without utilizing the men to the best advantage. As a matter act, $12,000 of the estimated increase for next year is for the eight agents we have asked for; also, last year there were five vacancies he field force which were not filled for several months.

The CHAIRMAN. Any further questions, gentlemen?

Doctor, I notice in (e) there you ask for $1,600 for necessary sup- s and equipment for the new agents. What do you mean by that?

Mr. ESTABROOK. We mean that each one of these new agents would uire a desk, a typewriter, a filing case, and a few things of that sort. might change a man from one station to another, in which event t item would cover drayage and the cost of freight on the public perty transported from one place to another. It is simply an esti- e of what would be required.

The CHAIRMAN. Any further questions, gentlemen? If not, that pletes your bureau. We are very much obliged to you.

HOUSE OF REPRESENTATIVES.
COMMITTEE ON AGRICULTURE.
Friday, February 4, 1921.

STATEMENT OF MISS CLARIBEL R. BARNETT, LIBRARIAN DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Before we take a recess for lunch, I want to the librarian, who is present, to be heard at this time, so we will have to bring her back. Miss Barnett is the librarian.

On page 165 of the Book of Estimates, Miss Barnett, you h three clerks at $1,020 each, in lieu of three clerks at $1,000 each an increase of $20 each. Tell us briefly why you desire this l increase.

Miss BARNETT. In our original estimates we asked for three tions at $1,140, instead of these three at $1,020. We have no positions at $1,000, and it seemed desirable to grade better t positions.

The CHAIRMAN. This is, then, really an increase of $20 in salary of these three clerks?

Miss BARNETT. We have not really decided on any particular to promote.

The CHAIRMAN. You would promote the efficient clerks in office?

Miss BARNETT. Yes, sir.

The CHAIRMAN. In item 7, three clerks at $1,000 each, a dec of three by change of three clerks at $1,020 each as above. Yo promoting three clerks?

Miss BARNETT. Yes, sir.

The CHAIRMAN. Item 8, six clerks at $900 each, increase of o transfer from statutory roll of secretary's office.

Miss BARNETT. Yes, sir.

The CHAIRMAN. Do you remember whether the secretary's ro reduced accordingly?

Mr. HARRISON. It has been reduced. This employee has be detail to the library for some time, and we are simply transf the position to the roll of the library, where she is actually wo

The CHAIRMAN. Your next change is in item 14, one mess messenger boy, or laborer, by transfer of one messenger boy a from lump sum, with change of title.

Why do you make the change of title, Miss Barnett?

Miss BARNETT. To make it possible to employ a laborer, if w a laborer, instead of a messenger boy.

The CHAIRMAN. Because it would be more flexible?

Miss BARNETT. Yes, sir.

The CHAIRMAN. Was your lump fund reduced by that an Miss Barnett?

Miss BARNETT. Yes, sir.

he CHAIRMAN. Item 15, two charwomen at $480 each, increase
ne from transfer from lump sum fund.
he lump fund in that case was reduced, although you are asking
an increase in your lump fund?
iss BARNETT. Yes, sir.
he CHAIRMAN. Page 166, for books of reference, technical and
ntific books, papers and periodicals, etc. You are asking an in-
se of $2,540. Tell us briefly why you wish this increase, and
it will be used.
iss BARNETT. We feel that we need more money for the purchase
ooks and periodicals. The department is, as you know, growing
rapidly, and the appropriation for the library for the purchase
ooks has not kept pace with the growth of the department. The
e offices there are the more reference books are needed, and we
that a greater increase in the fund is necessary to meet these new
ands.
he CHAIRMAN. How many volumes have you in your library, Miss
nett?
iss BARNETT. Approximately 133,000.
r. RUBEY. These are mostly books of a technical character?
iss BARNETT. Entirely scientific, technical, and agricultural.
r. RUBEY. Is it a central library, or do all the bureaus have their
libraries?
iss BARNETT. Most of the bureaus have libraries which are
nches of the main library.
r. HAWLEY. And the books are withdrawn from the central
ary?
iss BARNETT. We have in the main library a record of all the
ks in the department, including those which are deposited in the
ous bureaus.
he CHAIRMAN. What is the occasion for official traveling expenses
he library? That was asked on the floor of the House; I tried to
e an explanation, but I do not know whether I succeeded or not.
pose you give the explanation.
iss BARNETT. The traveling expenses for a number of years have
confined almost exclusively to the expenses in connection with
attendance of the librarian or a representative from the library
he meeting of the American Library Association and at other
ry meetings. It is an advantage in the work to have a repre-
ative of the library at these meetings.
he CHAIRMAN. Is that expense a nominal expense?
iss BARNETT. The expense ordinarily is less than $100.
r. MCLAUGHLIN. That kind of expense is a very proper item.
t other traveling expenses are there?
iss BARNETT. For the past several years there have been no
eling expenses except in connection with these meetings. Some-
s it would perhaps be an advantage for the librarian to attend a
of books, but, as a matter of fact, nothing of that kind has come
a number of years.
r. HAWLEY. Do the publishers of those books which are very
nsive allow experts to examine them before purchase, or do you
to purchase them without examination?
iss BARNETT. We have the privilege of examining a number of
s, but the scientists of the department are so familiar with the

literature of their subjects that in most instances they are able to tell the books they need without this preliminary examination.

Mr. HELGESEN. If you did want to examine them, you could find copies in the Congressional Library?

Miss BARNETT. We do, quite often.

Mr. HAWLEY. If they are published in this country?

Miss BARNETT. Yes, sir.

The CHAIRMAN. Are a good many books donated, or do you have to buy all of them?

Miss BARNETT. We have a great many given to us.

Mr. HOWELL. Are the employees of the department allowed to take books home?

Miss BARNETT. They are allowed to, but they are expected to have them accessible at the department during the day.

The CHAIRMAN. Are there any other statements?

Miss BARNETT. I should perhaps have said, in connection with the traveling expenses, that it might some time be an advantage for the librarian or some representative from the library to visit a number of the agricultural colleges and experiment station libraries. We feel that the department library should keep in close touch with other agricultural libraries, especially those of the State agricultural colleges and experiment stations, and it might seem worth while some years to have some one visit a number of these libraries. However, that has not been done in the past.

Mr. HAWLEY. What good would you expect to derive from it more than you could get from a catalogue?

Miss BARNETT. We feel that greater cooperation between these libraries and the department library resulting from this personal contact and personal knowledge would be of benefit to us in our work.

Mr. HAWLEY. Do you loan books from your library?

Miss BARNETT. Yes, sir.

Mr. HAWLEY. How long can they be kept?

Miss BARNETT. Ordinarily a month, including the time of going and coming.

Mr. HAWLEY. Who pays the transportation?

Miss BARNETT. The department, where the books are lent to the State agricultural colleges and experiment stations, which have been considered in some respects Federal institutions. We send books to them under franks, but other libraries pay the costs of forwarding.

The CHAIRMAN. Miss Barnett, we put into the bill a little proviso for you to exchange books. What exchanges have you made—how many books? If you have that, put it into the record, as somebody might ask the question.

Miss BARNETT. As a matter of fact, we have not been able as yet to do very much along this line. This proviso has only been in force seven months, and the value of the books exchanged thus far is less than $100. They consisted principally of Government documents, State laws, and other duplicates of that kind.

The CHAIRMAN. We are very much obliged to you, Miss Barnett.

The committee will now stand at recess until 3 o'clock this afternoon.

(Thereupon, at 12.10 o'clock p. m., the committee took a recess until 3 o'clock p. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Thursday, February 3, 1916.

RTHER STATEMENT OF MR. R. M. REESE, CHIEF CLERK OF THE DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Turn to page 167, gentlemen, "Miscellaneous penses, Department of Agriculture." That follows the library, t as the librarian is not here, we will go on with this. This covers ationery, blank books, etc.

Mr. REESE. No increase is asked for in this appropriation this year, d no portion is asked to be made immediately available.

The CHAIRMAN. I see you strike out the word "grounds."

Mr. REESE. That is taken care of in the Bureau of Plant Industry.

Mr. HAWLEY. How much have you spent under the item of rounds" heretofore?

Mr. REESE. About $400 last year.

The CHAIRMAN. Any questions on that item, gentlemen? If not, e will take up the next.

Mr. HELGESEN. In item 1, page 167, I notice you have a line for e purchase, subsistence and care of horses and the purchase and pair of harness and vehicles, and on page 215 you have an itemized count for maintenance, repair, and operation of passenger-carrying hicles. Last year that account was very much longer than now. hat was the reason for shortening it this year? Was some of it ıt in the lump funds?

Mr. REESE. The item on page 167 relates only to miscellaneous penses for carriages and horses for the official use of the Secretary Agriculture. The statement you refer to on page 215 covers the ıole department.

Mr. HELGESEN. The harness and vehicles refer to those in the city Washington.

Mr. REESE. Yes, sir; and for the use only of the Secretary of riculture.

The CHAIRMAN. Take up the item on the next page, for rent of ildings and parts of buildings in the District of Columbia, etc., 23,689.

Mr. REESE. No increase is asked in that item.

The CHAIRMAN. That is the rent item, gentlemen.

Mr. HELGESEN. Is this the total rent item for the entire depart-ent?

Mr. REESE. Yes, sir; with this exception: There is a permanent propriation for the meat-inspection service under the act of June, 06, which also provides for the payment of rent in the District of lumbia. That is a permanent annual appropriation.

Mr. HELGESEN. How much is that?

Mr. REESE. It is a permanent $3,000,000 appropriation for the meat-inspection service. The act includes authority for the payment of rent in the District of Columbia.

Mr. HELGESEN. How much rent under that appropriation is authorized?

Mr. REESE. The provision is for rent in the District of Columbia. $10,000 is paid under that authority. There is also authority for payment of rent in the District of Columbia in the continuing appropriation "Determining cotton standards and spot markets 1916," carried by the act of August 18, 1914. Rentals at the rate of $1,360 per annum are paid from this appropriation for temporary storage, Office of Markets and Rural Organization.

The CHAIRMAN. I will ask you to have inserted in the record here the statement in the Book of Estimates of the Secretary of the Treasury about the buildings rented by the Department of Agriculture for the fiscal year 1916 and for 1917. We had better put it in at this point.

(The statement referred to follows:)

Statement showing location, floor space, and rental charge of buildings rented by the Department of Agriculture in the District of Columbia for the fiscal year 1916.[1]

Name or location of building.	Purpose for which used.	Floor space (gross).	Annual rental.	Annual rental per square foot (gross).	Assessed valuation of buildings and grounds.	Proportion of rental covering cost of heat, light, water, elevator or other service.
Munsey Building, rooms 919-929.	Bureau of Animal Industry (offices).	336	$420.00	$1.15	$655,820.00	$100.00
Atlantic Building, 930 F Street NW.	Forest Service (offices).....	54,600	18,000.00	.32	138,672.00	1,458.00
Rear of 913 E Street NW..	Forest service (carpenter shop).	1,470	270.00	.18	400.00	None.
Willard Building, 513 to 515 Fourteenth Street NW.	Office of Public Roads (offices and laboratories).	36,324	9,500.00	.261	182,160.00	Do.
Globe Building, 339 Pennsylvania Avenue NW.	Bureau of Plant Industry (packeting, assembling, and mailing seeds; storage).	40,000	4,800.00	.12	30,476.00	Do.
Rear of 915 E Street NW...	Forest Service (storage).....	1,150	300.00	.26	300.00	Do.
1394 13 6 B Street SW.....	Bureau of Plant Industry (offices).	13,530	2,500.00	.18	18,160.00	Do.
1316 B Street SW.....	Office of the Solicitor (offices and storage).	10,427	3,000.00	.288	12,647.00	Do.
1358 B Street SW..... ...	Office of Markets, Bureau of Animal Industry, Library, Bureau of Biological Survey, Division of Publications, and Bureau of Plant Industry (offices and laboratories).	85,000	35,360.00	.416	182,744.00	Do.
215 Twelfth Street SW.....	Bureau of Plant Industry (offices).	2,771	450.00	.162	3,868.00	Do.
Rear of 215 Twelfth Street SW	Bureau of Chemistry (storage).	2,682	600.00	.223	3,483.00	Do.
217 Twelfth Street SW....	Office of Exhibits and Bureau of Plant Industry (offices).	2,771	450.00	.162	3,491.00	Do.
224 Twelfth Street SW.....	Office of Farm Management (offices)	12,360	2,500.00	.20	17,332.00	Do.
212-214 Thirteenth Street SW	Bureau of Chemistry (offices and storage).	8,600	960.00	.111	8,738.00	Do.
215 Thirteenth Street SW..	Division of Publications (offices and storage).	19,390	4,000.00	.206	21,736.00	Do.

[1] For the fiscal year 1917, it is not expected that there will be any changes in the above list, with the exception of the rental of an addition to the storage warehouse, No. 221 Linworth Place, and the contemplated abandonment of two or possibly three of the small storage buildings listed above. These changes will not involve any increase in the appropriation for rent.

t showing location, floor space, and rental charge of buildings rented by the De-nt of Agriculture in the District of Columbia for the fiscal year 1916—Continued.

or location of uilding.	Purpose for which used.	Floor space (gross).	Annual rental.	Annual rental per square foot (gross).	Assessed valuation of buildings and grounds.	Proportion of rental covering cost of heat, light, water, elevator or other service.
nth Street SW..	Bureau of Chemistry (offices and laboratories).	59,000	$16,000.00	$0.271	$98,776.00	None.
nth Street SW..	Insecticide and Fungicide Board (offices and laboratories).	9,900	3,000.00	.30	17,424.00	Do.
Linworth Place	Bureau of Animal Industry (storage).	297	120.00	.40	500.00	Do.
rth Place SW....	Bureau of Plant Industry, Bureau of Animal Industry, and Office of Markets (offices, warehouse, and cotton and paper work).	21,600	5,400.00	.245	30,849.00	Do.
urteenth Street	Bureau of Plant Industry, States Relations Service, Bureau of Biological Survey, and Forest Appeals (offices and laboratories).	15,140	3,000.00	.198	20,167.00	Do.
enth Street SW..	Bureau of Plant Industry and States Relations Service (offices and storage).	60,000	20,000.00	.33	120,925.00	Do.
S C Street SW...	Office of Public Roads (storage).	1,195	144.00	.12	400.00	Do.
h Street SW.....	Bureau of Soils, Bureau of Animal Industry, Office of Public Roads, and Office of the Chief Clerk (storage).	8,280	600.00	.072	16,393.00	Do.
and-a-Half Street	Office of Markets (storage)..	5,600	360.00	.064	3,767.00	Do.
reet NW.....	.....do.....	4,100	1,000.00	.243	.....	Do.
		.....	132,734.00	.....	.....	.....

rom continuing appropriation "Determining cotton standards and spot markets 1916," (Act 18, 1914).

iount paid for rent in the District of Columbia, $131,734.
rental, 28 cents per square foot.

RUBEY. Do you know of any public buildings owned by the ıment in the city of Washington that are vacant at the present

REESE. I don't know of any, unless it is the Maltby Building.
RUBEY. Is that building occupied now?
REESE. I understand the Interior Department is using a it.
RUBEY. This was put in the bill to keep the place from being ›wn, wasn't it?
REESE. I understand so.
CHAIRMAN. Are there any other questions on that item of

ANDERSON. Have you any information as to the relative econ-renting these buildings in the way you are now doing and the ıment's constructing its own buildings?
REESE. Yes, sir; I may say that a member of this committee roduced a resolution, House Resolution 56, which, if passed, quire the Secretary of Agriculture to report in detail on the ou raise. I am now at work in compiling the data for that

[illegible]

[illegible]

[illegible]

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Monday, February 7, 1916.

he committee met at 10 a. m., Hon. Asbury F. Lever (chairman) iding.

TATEMENT OF DR. A. C. TRUE, DIRECTOR OF THE STATES RELATIONS SERVICE.

he CHAIRMAN. Gentlemen, turn to page 168 of your Book of mates, and this morning we will take up the States Relations rice and ask Dr. True, the chief of that bureau, to take charge of hearing.

r. True, will you first take up your statutory roll and run over it fly. I find that between items 4 and 5 you seem to change the of one editorial clerk to one clerk, class 2.

r. TRUE. Yes; that clerk is included under item 8 on the next e.

he CHAIRMAN. What was the purpose in making that change?

r. TRUE. The purpose is to give us a little more freedom in filling ; position. It is not always practicable, as changes occur in our utory roll, to fill the position with an editorial clerk. It is better, ur judgment, that that position should be designated simply as a ılar clerical position.

'he CHAIRMAN. Then, in item 6 you have an increase of one clerk class 3 by transfer from lump fund for farmers' cooperative nonstrations in the South. Has that fund been reduced accordly?

)r. TRUE. Yes, sir.

The CHAIRMAN. Was this man transferred at the same salary?

)r. TRUE. Yes, sir.

The CHAIRMAN. There is no change in salary and there is a reduction in the lump fund?

)r. TRUE. Yes, sir.

The CHAIRMAN. Item 8, increase of three clerks of class 2, two by nsfer from lump funds for administrative expenses and farmers' perative demonstrations in North and West, and one in lieu of clerk or editorial clerk, at $1,400, omitted as above. In the case those two transfers, were they transferred at the same salary?

)r. TRUE. Yes, sir.

The CHAIRMAN. And the fund reduced by that amount?

)r. TRUE. Yes, sir; and I may say, Mr. Chairman, that that is true through this list. There is no increase in the salaries at all. It is

simply a transfer in accordance with the law from the lump su
the statutory roll.

The CHAIRMAN. And in all cases has the lump fund been redu

Dr. TRUE. Yes, sir.

The CHAIRMAN. Item 9 is the same?

Dr. TRUE. Yes, sir.

The CHAIRMAN. Item 10 is the same?

Dr. TRUE. Yes.

The CHAIRMAN. Item 11 the same?

Dr. TRUE. Yes.

The CHAIRMAN. Item 13 the same?

Dr. TRUE. Yes.

The CHAIRMAN. Item 14 the same?

Dr. TRUE. Yes.

The CHAIRMAN. Item 16, three messengers, messenger bo
laborers, at $600 each. There is an increase there; is that the

Dr. TRUE. The same.

The CHAIRMAN. Item 17, 10 messenger boys, at $480. Is th
same, too?

Dr. TRUE. The same.

The CHAIRMAN. Item 18 the same?

Dr. TRUE. The same.

The CHAIRMAN. Item 21 the same?

Dr. TRUE. Yes, sir.

The CHAIRMAN. Item 22 the same?

Dr. TRUE. Yes, sir.

The CHAIRMAN. What are those laborers or charwomen at
mostly charwomen, are they?

Dr. TRUE. A number of charwomen and laborers employed
the building.

The CHAIRMAN. How long do they work a day—just a few

Dr. TRUE. Those at $240 work a few hours.

The CHAIRMAN. In all cases where there have been transfe
transfers have been made at the same salary and the lump
reduced?

Dr. TRUE. Yes, sir.

The CHAIRMAN. That applies to all of your statutory roll?

Dr. TRUE. Yes, sir.

The CHAIRMAN. All right. Then, we will take up your
expense item on page 171, "to carry into effect the provisions
act approved March 2, 1887, entitled 'An act to establish agric
experiment stations.'" That is the fund for carrying on th
of the experiment stations throughout the country?

Dr. TRUE. Yes, sir.

The CHAIRMAN. And there is no change, of course; that is
manent fund?

Mr. HELGESEN. These two acts—one is for agricultural e
and the other for agricultural experiment station; isn't that

Dr. TRUE. No, sir; they are both for experiment stations.
are two experiment station acts; one known as the Hatch A
the other known as the Adams Act.

The CHAIRMAN. This last is the Adams Act of 1906?

Dr. TRUE. Yes, sir.

Mr. HELGESEN. Both for experimental stations?

Dr. TRUE. Yes, sir.
Mr. HELGESEN. What relation is there between the experiment sta-ns and the agricultural college?
Dr. TRUE. The experiment stations, under the law, are, as a rule, partments of the college. There are only a few exceptional cases ere stations were established before the Federal legislation was sed. For example, in Ohio there was an experiment station as a arate organization. The law permits a continuance. In almost cases they are departments of the agricultural college.
Mr. HELGESEN. Are they made so by law?
Dr. TRUE. Yes, sir.
Mr. HELGESEN. Do you know anything about the situation in North kota?
Dr. TRUE. In a general way.
Mr. HELGESEN. Do you know whether that has been separated en-ly from the college?
Dr. TRUE. No, sir. It can not be separated from the college under law. What they have done in North Dakota, as I understand it, o make the director of the experiment station report directly to board of trustees instead of to the president of the college, as is ordinary practice in other States.
Mr. HELGESEN. Yes; but he does not confine himself to that; he erferes with the work of the college as well.
Dr. TRUE. If he does, that is unfortunate.
Mr. HELGESEN. It is so unfortunate that it is going to make a State ne, and if it ever breaks out, which now seems likely, I think all nty lines and everything else will be forgotten.
The CHAIRMAN. What is that situation?
Mr. HELGESEN. Why, they have practically separated the experi-nt station from the agricultural college by making the superin-ident report directly to the board of trustees instead of to the sident of the college, so that they do no work in harmony at all. ey are absolutely two separate institutions, as much so as though y were in different States; and, of course, it interferes with the fulness of the station.
The CHAIRMAN. Who appoints the director of the experiment sta-n?
Mr. HELGESEN. The board of trustees.
The CHAIRMAN. He is appointed by the board of trustees of the llege?
Dr. TRUE. Yes, sir.
The CHAIRMAN. I know that is true at Clemson College.
Mr. MCLAUGHLIN. You mean there is a lack of sympathy and co-eration between the board of trustees and the president of the llege?
Mr. HELGESEN. Yes.
Mr. HOWELL. That is a matter entirely within the control of the ard of trustees, is it not?
Mr. HELGESEN. That is what I was trying to find out. The testi-ny here is that they can not separate the two as they have done. lo not know how far that will go.
Mr. MCLAUGHLIN. Practicaly speaking, unless the college con-rms to the law under which it gets this money it may be withheld.

CANCEL LIBRARY

Mr. [illegible] Does [illegible] and the practical result o
[illegible] economic working of the two institut
[illegible] to interfere?

[illegible] that it would be our busin
[illegible] funds. We might o
[illegible] as a matter of fact, in the case
[illegible] and pointed out th
[illegible]

Mr. [illegible] going to make any accusation
[illegible] impression up
[illegible] working of the [illegible]
[illegible] Do you kn

[illegible] statements we have made
[illegible]

[illegible] that [illegible] at the
[illegible] and [illegible] and [illegible]
[illegible] and [illegible] and [illegible]
[illegible] and [illegible] and [illegible]

college. It is for the people of the State and the board of trus-
representing them to make the proper arrangements of the man-
ment of the college, including the experiment station.
he CHAIRMAN. What is your legal connection with the agricul-
l colleges and experiment stations under the law, Doctor? Just
t function do you perform?
r. TRUE. With reference to the experiment stations?
he CHAIRMAN. And the colleges also. Now, under the extension
you pass upon the projects as they are submitted to you.
r. TRUE. Yes, sir.
he CHAIRMAN. Is a like plan followed with reference to the col-
s? Do they submit their course of instruction? Do the experi-
t stations submit their projects to you from time to time in order
et your approval?
r. TRUE. So far as the teaching departments of the college are
erned, we have nothing to do with that. The Federal supervision,
ar as the law permits it, is through the Department of the Inte-
and the Bureau of Education. As regards the experiment sta-
s, we deal with them under the two acts.
he CHAIRMAN. The Hatch Act and the Adams Act?
r. TRUE. Yes; under the Hatch Act our jurisdiction is more gen-
and limited, and we have not felt that we had the authority
equire the stations, so far as their expenditures under that act
concerned, to submit their plan of work to us. Under the Adams
we do not require them to submit their plans in advance.
he CHAIRMAN. Doctor, in that connection I think it would be
well to insert the Hatch and Adams Acts into the record.
The two acts mentioned are as follows:)

ACT OF 1887 ESTABLISHING AGRICULTURAL EXPERIMENT STATIONS.

[Hatch Act.]

ACT To establish agricultural experiment stations in connection with the colleges ablished in the several States under the provisions of an act approved July second, hteen hundred and sixty-two, and of the acts supplementary thereto.

it enacted by the Senate and House of Representatives of the United es of America in Congress assembled, That in order to aid in acquiring diffusing among the people of the United States useful and practical in-ation on subjects connected with agriculture, and to promote scientific stigation and experiment respecting the principles and applications of ultural science, there shall be established under direction of the college lleges or agricultural department of colleges in each State or Territory lished, or which may hereafter be established, in accordance with the isions of an act approved July second, eighteen hundred and sixty-two, led "An act donating public lands to the several States and Territories h may provide colleges for the benefit of agriculture and the mechanic " or any of the supplements to said act, a department to be known and nated as an "agricultural experiment station": *Provided*, That in any e or Territory in which two such colleges have been or may be so estab-d the appropriation hereinafter made to such State or Territory shall be lly divided between such colleges, unless the legislature of such State or itory shall otherwise direct.

c. 2. That it shall be the object and duty of said experiment stations to uct original researches or verify experiments on the physiology of plants animals; the diseases to which they are severally subject, with the reme-of the same; the chemical composition of useful plants at their different s of growth; the comparative advantages of rotative cropping as pursued

States Commissioner [now Secretary] of Agriculture to furn
as practicable, for the tabulation of results of investigation o
indicate from time to time such lines of inquiry as to him sh
portant, and, in general, to furnish such advice and assist
promote the purpose of this act. It shall be the duty of eac
annually, on or before the first of February, to make to the
State or Territory in which it is located a full and detailed r
tions, including a statement of receipts and expenditures, a
port shall be sent to each of said stations, to the said Commis
sary] of Agriculture, and to the Secretary of the Treasury of

SEC. 4. That bulletins or reports of progress shall be publi
tions at least once in three months, one copy of which shall
newspaper in the States or Territories in which they are re
ment to such individuals actually engaged in farming as may
and as far as the means of the station will permit. Such bu
and the annual reports of said stations shall be transmitted b
United States free of charge for postage, under such regula
master General may from time to time prescribe.

SEC. 5. That for the purpose of paying the necessary expen
investigations and experiments and printing and distributi
hereinbefore prescribed, the sum of fifteen thousand dollars p
by appropriated to each State, to be specially provided for b
appropriations from year to year, and to each Territory entit
visions of section eight of this act, out of any money in the Tr
from the sales of public lands, to be paid in equal quarterly
first day of January, April, July, and October in each year, t
other officer duly appointed by the governing boards of said
the same, the first payment to be made on the first day of
hundred and eighty-seven: *Provided, however*, That out of
appropriation so received by any station an amount not exceed
be expended in the erection, enlargement, or repair of a buil
necessary for carrying on the work of such station; and ther
not exceeding five per centum of such annual appropriation ma

SEC. 6. That whenever it shall appear to the Secretary of t
the annual statement of receipts and expenditures of any of
a portion of the preceding annual appropriation remains
amount shall be deducted from the next succeeding annual
such station, in order that the amount of money appropriat
shall not exceed the amount actually and necessarily requi
tenance and support.

SEC. 7. That nothing in this act shall be construed to imp
legal relation existing between any of the said colleges and

l college or school, and no legislature shall by contract, express or
nhle itself from so doing.
'hat the grants of moneys authorized by this act are made subject to
ive assent of the several States and Territories to the purposes of
: *Provided*, That payment of such installments of the appropriation
le as shall become due to any State before the adjournment of the
sion of its legislature meeting next after the passage of this act
nde upon the assent of the governor thereof duly certified to the
)f the Treasury.
Nothing in this act shall be held or construed as binding the United
ontinue any payments from the Treasury to any or all the States or
mentioned in this act, but Congress may at any time amend, sus-
peal any or all the provisions of this act.
l, March 2, 1887 (24 Stat. L., 440).

906 FOR THE FURTHER ENDOWMENT OF AGRICULTURAL EXPERIMENT STATIONS.

[Adams Act.]

provide for an increased annual appropriation for agricultural experiment stations and regulating the expenditure thereof.

acted by the Senate and House of Representatives of the United
merica in Congress assembled, That there shall be, and hereby is,
ppropriated, out of any money in the Treasury not otherwise appro-
be paid as hereinafter provided, to each State and Territory, for the
lete endowment and maintenance of agricultural experiment stations
ished or which may hereafter be established in accordance with the
gress approved March second, eighteen hundred and eighty-seven, the
thousand dollars in addition to the sum named in said act for the
g June thirtieth, nineteen hundred and six, and an annual increase
unt of such appropriation thereafter for five years by an additional
thousand dollars over the preceding year, and the annual amount to
reafter to each State or Territory shall be thirty thousand dollars, to
only to paying the necessary expenses of conducting original re-
experiments bearing directly on the agricultural industry of the
tes, having due regard to the varying conditions and needs of the
States or Territories.
'hat the sums hereby appropriated to the States and Territories for
endowment and support of agricultural experiment stations shall be
aid in equal quarterly payments on the first day of January, April,
)ctober of each year by the Secretary of the Treasury, upon the war-
Secretary of Agriculture, out of the Treasury of the United States,
surer or other officer duly appointed by the governing boards of said
stations to receive the same, and such officers shall be required to
ie Secretary of Agriculture on or before the first day of September of
a detailed statement of the amount so received and of its disburse-
:hedules prescribed by the Secretary of Agriculture. The grants of
horized by this act are made subject to legislative assent of the
ites and Territories to the purpose of said grants: *Provided*, That
such installments of the appropriation herein made as shall become
State or Territory before the adjournment of the regular session of
meeting next after the passage of this act shall be made upon the
he governor thereof, duly certified by the Secretary of the Treasury.
hat if any portion of the moneys received by the designated officer of
)r Territory for the further and more complete endowment, support,
:nance of agricultural experiment stations as provided in this act
ıy action or contingency be diminished or lost or be misapplied, it
placed by said State or Territory to which it belongs, and until so
subsequent appropriation shall be apportioned or paid to such State
y; and no portion of said moneys exceeding five per centum of each
ropriation shall be applied, directly or indirectly, under any pretense
:o the purchase, erection, preservation, or repair of any building or
)r to the purchase or rental of land. It shall be the duty of each
ions annually, on or before the first day of February, to make to the
f the State or Territory in which it is located a full and detailed

report of its operations, including a statement of receipts and expenditures, a copy of which report shall be sent to each of said stations, to the Secretary of Agriculture, and to the Secretary of the Treasury of the United States.

SEC. 4. That on or before the first day of July in each year after the passage of this act the Secretary of Agriculture shall ascertain and certify to the Secretary of the Treasury as to each State and Territory whether it is complying with the provisions of this act and is entitled to receive its share of the annual appropriation for agricultural experiment stations under this act and the amount which thereupon each is entitled, respectively, to receive. If the Secretary of Agriculture shall withhold a certificate from any State or Territory of its appropriation, the facts and reasons therefor shall be reported to the President, and the amount involved shall be kept separate in the Treasury until the close of the next Congress, in order that the State or Territory may, if it shall so desire, appeal to Congress from the determination of the Secretary of Agriculture. If the next Congress shall not direct such sum to be paid, it shall be covered into the Treasury; and the Secretary of Agriculture is hereby charged with the proper administration of this law.

SEC. 5. That the Secretary of Agriculture shall make an annual report to Congress on the receipts and expenditures and work of the agricultural experiment stations in all of the States and Territories, and also whether the appropriation of any State or Territory has been withheld, and if so, the reasons therefor.

SEC. 6. That Congress may at any time amend, suspend, or repeal any or all of the provisions of this act.

Approved, March 16, 1906 (34 Stat. L., 63.)

The CHAIRMAN. And then it goes on to tell about the publication and distribution of the experiment station bulletin, the annual appropriation, and so on. That seems to about cover the relationship between the department and the colleges.

Mr. MCLAUGHLIN. Mr. Chairman, is it not true that a separate appropriation like the one Mr. Helgesen speaks of for this flax work does not come under the law as you have read it?

The CHAIRMAN. No; it would not.

Mr. MCLAUGHLIN. That appropriation is made to enable the proper bureau here to work with and cooperate with the colleges, and in that work neither the department nor the colleges is controlled in any way by the act that the chairman has read.

Mr. HELGESEN. That is true, but I also understand that no appropriation can be made here directly to a college. It has to be expended through the department, and they work in cooperating with the college.

Mr. MCLAUGHLIN. This appropriation that you speak of for flax is made to the department.

Mr. HELGESEN. That is what I say. Now, if the college did not get any of that or any cooperation from the department, the blame must lie with the department.

Mr. MCLAUGHLIN. But the department here can spend that money in any way it pleases.

Mr. HELGESEN. True.

Mr. MCLAUGHLIN. If it thinks that the best results can be reached by turning over a part of that money for the college to carry on its work or that work provided for in the special act, it is not influenced or controlled in any way, and neither the department nor the college is controlled in any way by any part of the act which the chairman read.

Mr. HOWELL. That appropriation would be entirely within the jurisdiction of the Bureau of Plant Industry, if I remember it.

Dr. TRUE. Yes, sir.

The CHAIRMAN. That is true.

Mr. HELGESEN. No doubt it would.
The CHAIRMAN. I happened to be reading over Hinds' Precedents the subject of appropriations, and I found a very interesting de- on along this line. It was a case involving Mr. Howell's State. amendment was offered to this section right here in this bill, viding that none of this appropriation should be available to that te if certain things were done, namely, if any member of the board trustees were engaged in a lynching——
Mr. MCLAUGHLIN (interposing). A what?
The CHAIRMAN. A lynching, or belonged to the Mormon church, something like that, many years ago when that was a burning stion here. I think, as I recall it, the chairman of the committee the whole held it not to be a limitation of law but a change of law, l it was therefore out of order. It was rather an interesting dis- sion of the whole question.
Mr. HELGESEN. Now, Mr. Chairman, you read the law and stated t in your opinion an experiment station was a part of the agri- tural college.
The CHAIRMAN. I say that from a casual reading of the law it ns to be so.
Dr. TRUE. It must be, Mr. Chairman.
Mr. HELGESEN. Now, if that is the case, the Federal Government is nishing money and we have a Federal department here that looks er the spending of the money—to see that it is done properly. n't you think that the Federal Government would have some say o whether or not the board of trustees up there could so segregate two as to absolutely separate them for all practical purposes?
Dr. TRUE. I do not understand that to be the situation.
The CHAIRMAN. As I understand it, from section 3 of the act, all t the Department of Agriculture can do in an affirmative way is furnish such advice and assistance as will best promote the pur- es of the act. But I think the point Mr. Helgesen is trying to ng out and that I would like to have your opinion on is as to ether or not the department here has any veto power upon the s of these experiment stations beyond seeing that the money is ended in research work in line with the act under which they were ablished. For instance, could you say to the college in North kota, "I do not like Mr. Smith whom you have designated as ector of the experiment station, and therefore I will withhold the propriation to that State for the experiment station until you have vided a man who is agreeable to the department"? Now, you can that under the agricultural extension act, as I understand it, but you do it under the Hatch Act.?
Dr. TRUE. No, sir; not on that basis. If the North Dakota board rustees should appoint a man as director of the station who had no lifications for such work, we would object to that. If they carried any work that we thought did not conform to the provisions of the leral act, we would object to that. But when the board of trustees ply determines that, instead of having the director of the station ort to the president of the college, that director shall report to board, we do not feel that this is cause enough for us to interfere.
Mr. HELGESEN. But if you found the practical result to be that act of the board of trustees had the result of segregating

the two institutions and that were no longer working in harmony in the interest of accomplishing the best results, that they had reached a point where they were at swords points now and interfering with each other, and that they had a board of trustees which, for some reason which we do not need to mention now, had taken an active part in that issue which segregated the two institutions. I think you will agree that it was not for the best interest of the college or the experiment station. If that be true—if upon investigation you find that to be true—don't you think you have the right to step in there and see to it that those two institutions must work harmoniously for the best interests of the State?

Dr. True. I think it is our business to see that no arrangement is made to interfere with the proper expenditure of the Federal funds for experiment station purposes, but I do not think it is our function to interfere with the action of the board of trustees that relates simply to the internal affairs of the institution.

Mr. Anderson. The question that seems to agitate Mr. Helgesen is not the proposition as to one which relates to the administration of which, as I apparently relates to the administration, but one which is greatly diminishing the effectiveness of the experiment station.

Mr. McLaughlin. Yes; and Mr. Helgesen's statement was pretty clear and covered several matters. You have stated that the result of what they are doing is there will be an absolute separation of the experiment station from the college—that they will be practically and in effect two separate institutions. Now, Dr. True says that the experiment station must be a part of the college and connected with it.

Mr. Helgesen. But is it now no more a part of the college than the fact that they both nominally report to the same board of trustees? Otherwise they might as well be a thousand miles apart.

Mr. McLaughlin. It would seem to me that it is the duty of the department—Dr. True's bureau or some other authority—to determine what the result is and whether the effect is to separate them and if the facts as stated by Mr. Helgesen prove to be true, to forbid it and see that it is discontinued. Then they have the larger authority to see whether the work is being properly done. But the first thing would seem to be for them to determine whether it is a separation—whether it makes them two separate institutions—because the law requires that the experiment station shall be a part of the college.

Mr. Helgesen. They can not be a part of the college in a practical sense unless they work harmoniously together. That is how it is. From the reports I have given, they are not working harmoniously. I am not stating those as absolute facts, because I am going to investigate the situation myself, but I simply want the Department to investigate the rumors and see whether they are true. I am putting it up to you as a hypothetical question: that if these things are true, then what would be your duty in the matter? It seems to me that that fight is being made against Prof. Bolley, the professor of the college, and my information is that they have taken away his assistants away, that they have taken his funds away, and that they say, "Now, you can stay there as long as you want to, but you will have to work all by yourself, or without any help from anybody.

You can readily see that he can not do the effectual work that he is capable of doing. It is a sorry state of affairs if the statements I get are true. For this reason, I would like to get the proper authority, wherever it exists, to take up this matter, go into a thorough investigation of it, and find out whether the Federal Government has any power to smooth things out up there in such a way that they will be as effective in the future as they have been in the past.

Dr. TRUE. We shall be very glad to follow the matter up as far as we have the authority to do so.

Mr. HELGESEN. What I am getting at is this: Assuming that it is true that the two institutions have, for all practical purposes—not technically, but for all practical purposes—been separated from each other and that they are not working in harmony with each other, have you any right under those conditions to go up there and demand that they shall be made one institution and work harmoniously together?

Dr. TRUE. If we understood that they had been made two separate institutions——

Mr. HELGESEN (interposing). I am saying for all practical purposes. Certainly they are both under the same board of trustees. If that is as far as you can go, of course they are one. But if, as a matter of actual fact, they are working independently of each other and they refuse to work together, then it seems to me that they are separated, from every practical point of view.

Dr. TRUE. That depends upon the exact circumstances. The function of the experiment station is to make investigations, and it must confine itself to that work. Now, if that institution in North Dakota has a competent director and under him there is a competent staff of experts and they are engaged in appropriate lines of investigation, that makes, from our point of view, a good experiment station; and if that station is under the control of the board of trustees of the North Dakota Agricultural College, I do not think that we can go beyond that in our supervision. Now, if it should come to our knowledge that any man employed in that station was deprived of proper arrangements for carrying on investigations, why then we would look into the matter.

Mr. HELGESEN. And you would not have the same authority with respect to the colleges?

Dr. TRUE. We have no authority with respect to the teaching departments of the colleges.

Mr. HELGESEN. Do you think that there can be and ought to be a complete separation between the teaching part of the college and the experiment station?

Dr. TRUE. No; we do not think that.

Mr. ANDERSON. That is what Mr. Helgesen says there is.

Dr. TRUE. We have advised the North Dakota college that we do not think the arrangement they have is a good one.

Mr. ANDERSON. That is all right so far as it goes; but what Mr. Helgesen wants to know is how much farther than that you can go.

Dr. TRUE. We do not feel that we can go any further.

Mr. HELGESEN. You were just saying that if an experiment station had a director who is competent to do the work and was doing good experimental work that is as far as you would go. Now, can any director of an experiment station (it does not make any difference how competent he is) do the most intelligent and effective work

unless he works in harmony with the pathological department the college?

Dr. TAIT. If there are experiments in plant pathology going on in connection with the station the director of the station must have to control the man who is doing that, as far as his experiments are concerned.

Mr. HUTCHESON. Then the effectiveness of the pathologist would depend wholly on the good will of the director. Is that the case?

Dr. TAIT. Not entirely, because back of the director is the board of trustees, and the supposition is that if things do not go right as regards the relation between the director and his pathologist the board of trustees will take up the matter.

Mr. HUTCHESON. But suppose the board of trustees takes sides in the matter and supports one or the other side, and thereby there is no harmonious work; then what?

Dr. TAIT. Then you have an unfortunate situation.

Mr. HUTCHESON. Which you can not interfere with?

Dr. TAIT. We can interfere only as far as we find out that the work of the station is not being properly done.

Mr. HUTCHESON. But do you think the work of the station is being properly done unless the college and the experiment station work properly together?

Dr. TAIT. I do not think that is an ideal state of things.

Mr. HUTCHESON. Ideal? Well, that is putting it pretty mildly. Do you think it is a practical thing?

Dr. TAIT. I should say so, under certain conditions.

Mr. HUTCHESON. Well, I will tell you: I am satisfied that the thing will right itself pretty soon, because it will never continue as it is now.

Dr. TAIT. That is my judgment.

Mr. HUTCHESON. And whether you people think you have any authority and whether you want to interfere or not, there will probably be something done to get results.

Dr. TAIT. I suppose you gentlemen understand that in the management of our agricultural colleges, which are very complex in their organization, all sorts of questions arise as to the details of organization and the relations of individuals in those institutions. Now, if the Department of Agriculture undertook to run these institutions and meddle with the internal workings of them, we should have, I am sure, lots of trouble and no very great results.

Mr. HUTCHESON. Oh, I do not think anybody would ask this department to meddle with the details of the experiment stations or agricultural colleges, but it does seem to me that if the department had any organization worth while it ought to have, in general, a plan that the agricultural college and the experiment station should follow, so that they could not absolutely ignore each other and work separately from each other. That situation is absolutely ridiculous and there ought to be some authority outside of the college somewhere capable of adjusting the situation, because when these local factional fights get started in a community it is almighty difficult to stop them. If there was an authority outside of the State that would take a judicial view of it and say, "Now, you are varying from the general plan that has been adopted by the Federal Government ... you can not continue in that way," I have no doubt that

ey would get together and fix it up. If there is no such power tside the State, there certainly ought to be. I do not know how uch study you have given to your authority, but it is hardly be-vable to me that you have no authority at all to demand that it all be done along certain general lines.

The CHAIRMAN. The department does have authority under sec-on 3 of the act to see that the lines of investigation are uniform a character, following the general uniform purpose, and he has uthority from time to time to see that the results are tabulated a certain form, and also to advise and assist. Now, it seems to e that is all I find in the act, Mr. Helgesen.

Mr. HELGESEN. Maybe the law does not give any authority; if so, e will have to give them some.

Mr. HOWELL. I think the idea of the law is that every State is pable of managing its own agricultural colleges.

The CHAIRMAN. I think so.

Mr. HELGESEN. That is true, generally speaking. If the condition at I have described does exist, it shows this: You say a family as the right to manage its own affairs, and yet you see how many milies are all broken up into factions and destroyed. The same true of any other institution—an agricultural college or any other ublic institution—and under such unusual conditions there ought be some one to step in there and harmonize them.

The CHAIRMAN. In my opinion, the act does not do anything ex-pt turn over to the States $15,000 a year to be used in certain neral lines of investigational work, without any conditions or rings attached to it. Now, in the agricultural-extension act the nditions precedent must be complied with before the appropria-ons are available from the Federal Treasury. I think this is an nprovement on the general policy of Government that this distin-uished committee has made, and it is unfortunate that we were not charge of this thing when this Hatch law was enacted, but we ere not, as a matter of fact, because that act was passed in 1887.

Mr. HELGESEN. Well, amendments are always in order.

The CHAIRMAN. And in that connection, gentlemen, there is a re-ort in Missouri, which Speaker Clark says is not true, that the ther of the Hatch Act, Mr. Hatch himself, was defeated for re-ection to Congress largely on account of the fact that he was the ther of this act and that it did not give to the farmer all that the rmer thought was coming to him. I do not know whether that is ue or not. I heard it four years ago.

Mr. HELGESEN. That is aside from the question. The presump-on under all the laws we have is that the agricultural college nd the experiment station are one and the same institution working gether. Now, if for all practical purposes they are not working gether it does not seem to me that they are complying with the law; nd if they are not complying with the law why should they be sup-orted? Do you contend, or does anybody contend that if they are ot complying with the law they are entitled to the money that other-ise ought to go to them?

The CHAIRMAN. No; I do not make that contention at all, and I do ot think Dr. True does.

Dr. TRUE. No; I do not.

Mr. HELGESEN. Dr. True says that technically they are not two institutions out there for technical purposes only, but if the practical result is that that situation exists that somebody ought to do what has been done in the case of the outside party step in there and help the matter out.

Mr. MCLAUGHLIN. It may be a case for the Supreme Court of the State of North Dakota.

Mr. HELGESEN. Don't you worry about the future. The Supreme Court has to decide that. The people will do it after a while. I do not want that we should have to suffer.

Mr. MCLAUGHLIN. Worrying about it? I am not worrying about it. It is the gentleman on this committee that seems to be worrying about it.

Mr. HELGESEN. I did not mean that; I will take it back.

Mr. MCLAUGHLIN. But it would seem to me that if a board has been created for a particular purpose, with more or less particular lines, and they go to greater outside and usurping functions not in accordance with the law, they can be restrained by your supreme court. It is a matter between the two authorities there, which can be threshed out in the supreme court.

Mr. SUTER. You would elect a new board?

Mr. MCLAUGHLIN. I am not worrying about the situation out there.

The CHAIRMAN. All right, Dr. True; I think Mr. Helgesen is through.

Mr. HELGESEN. I was trying to find out whether there is any authority to deal with that matter.

Mr. MCLAUGHLIN. There is certainly authority to see that they are two separate institutions practically, or in any other way.

Mr. HOWELL. Dr. True, I see there is an appropriation of $30,000 in these two items for the benefit of each State experiment station. What other Federal funds are there available for the different agricultural colleges in the country? What is the total from the Federal Government for each agricultural college and experiment station?

Dr. TRUE. To get the whole story we must go back to the act of 1862, which provided for the sale of a large amount of public land, the proceeds of which were to constitute a fund for the maintenance of these institutions. They get the interest on that fund as a part of their income. It varies in the different States. Then, under the act of the Morrill Act and the Nelson amendment, each State gets $25,000 a year for the maintenance of instruction in those colleges. Under the experiment station act, as indicated here, each State gets $30,000 a year. Under the extension act——

Mr. HOWELL. I did not refer to the extension act.

Mr. TRUE. The extension act is a part of it, because that money goes to the college; they get the $10,000 and an additional amount according to the rural population.

Mr. HOWELL. Outside of the extension act, there is $50,000 for the maintenance of instruction in the college and $30,000 additional under the Hatch and Adams Acts?

The CHAIRMAN. It makes $80,000 in all, outside of the extension——

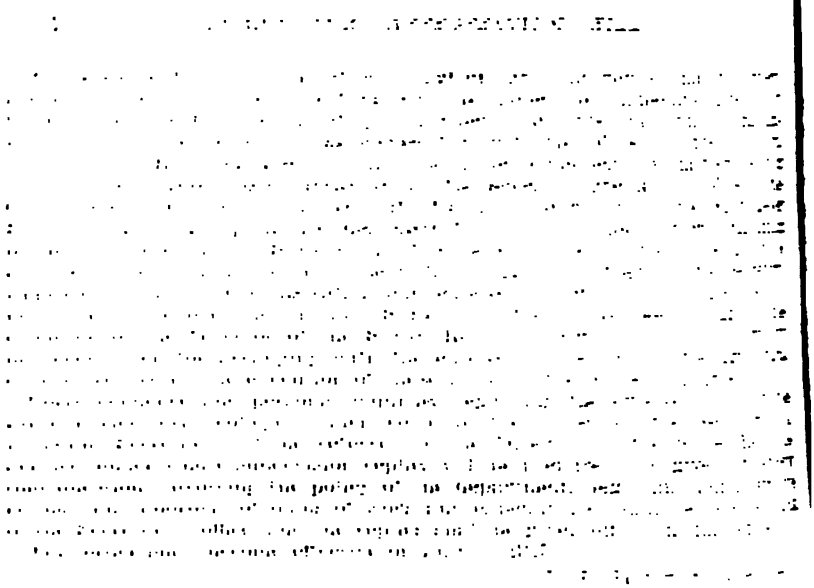
Yes, sir.

Mr. HOWELL. You say some States have an additional amount?
Mr. TRUE. They get the interest on the proceeds of the land grant.
Mr. HOWELL. So that the agricultural colleges of some States re-
e more out of the Federal Treasury than others?
Mr. TRUE. That money does not come out of the Federal Treasury.
as the land grant.
Mr. HOWELL. Of course, the land grant was made to the States?
Mr. TRUE. Yes, sir.
Mr. MCLAUGHLIN. And in one State the land would yield more
n in another.
Mr. HOWELL. Yes; but I asked how much came out of the Federal
asury.
Mr. TRUE. The $80,000 in addition to the extension money. Now,
ould like to make a very brief statement about the organization
he States Relations Service.
The CHAIRMAN. All right, Doctor, tell us about the arrangement
your work.
Mr. TRUE. The States Relations Service was organized on the 1st
July, 1915, in accordance with the authority granted by Congress
he Secretary of Agriculture for the partial reorganization of the
artment. The object of creating the service was to bring together
one organization the business of the department relating to the
icultural colleges and experiment stations and certain activities
he department which are intimately associated with such work.
Secretary issued an order, known as memorandum No. 140, for
organization of the States Relations Service. Shall I take the
to read this? It is not very long.
he CHAIRMAN. Suppose you read it, Doctor.
r. TRUE. It reads as follows:

MEMORANDUM NO. 140—ORGANIZATION OF STATES RELATIONS SERVICE.

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., June 8, 1915.

accordance with the provisions of the act of Congress of March 4, 1915,
ing appropriations for the Department of Agriculture, I hereby establish a
es Relations Service in this department, which shall represent the Secretary
griculture in his relations with the State agricultural colleges and experi-
t stations under the acts of Congress of July 2, 1862; August 30, 1890; March
87; March 16, 1906; May 8, 1914; and acts supplementary thereto, and in
ying out the provisions of acts of Congress making appropriations to this
rtment for farmers' cooperative demonstration work, investigations relat-
to agricultural schools, farmers' institutes, the relative utility and economy
gricultural products used for food, clothing, and other uses in the home, and
maintenance of agricultural experiment stations in Alaska, Hawaii, Porto
, and Guam, and in such other matters as the Secretary of Agriculture shall
gnate from time to time.
he States Relations Service shall include the following officers: (1) The
e of the director of the service, which shall include those officers and em-
ees engaged in the general work and administration of the service; (2) the
e of experiment stations, including the work of the service relating to agri-
ural experiment stations; (3) the office of extension work in the South,
uding the farmers' cooperative demonstration work and the Smith-Lever
cultural extension work in 15 Southern States; (4) the office of extension
k in the North and West, including the farmers' cooperative demonstration
k and the Smith-Lever agricultural extension work in 33 Northern and
tern States; and (5) the office of home economics, including investigations
tive to foods, clothing, and household equipment and management.



The Chairman. Now suppose we take up the [illegible] purpose of the whole program, [illegible] experiment stations.

Dr. True. [illegible]

Mr. Anderson. May I ask a question? In what [illegible] work done under the States Relations Service?

Dr. True. We get most of our researches [illegible] "Home economics" studies of the cooperative [illegible] and farmers' institutes and investigations at [illegible] stations.

Mr. Anderson. Would you say approximately [illegible] is spent for that purpose and from what appropriation?

Dr. True. There are two or three items in the program [illegible] page 37, for instance, we have the regular experiment [illegible] which there is a total appropriation of $1[illegible],000; on page [illegible] farmers' institutes and agricultural schools, carrying an [illegible] of $[illegible],000; in both these figures statutory salaries are included.

Mr. Anderson. Is that work on farmers' institutes and agricultural schools done in Washington?

Dr. True. Not all of it. The headquarters are in Washington but the men go out and study the problems in the States.

Mr. Anderson. That is an investigational work rather than research work.

Dr. True. Yes, it is not the ordinary kind of scientific research work. Then, on page 376, we have the home-economics investigations which has a total of $29,980.

STATEMENT OF DR. E. W. ALLEN, CHIEF OF THE OFFICE OF EXPERIMENT STATIONS, STATES RELATIONS SERVICE.

The Chairman. Dr. True, let us know something about the item which appears on page 378 of the Program of Work.

Dr. True. That covers our relations with the State experiment [illegible]. The work is in charge of Dr. E. W. Allen, who can discuss [illegible] desire to hear him.

ıe CHAIRMAN. All right, Dr. Allen. Tell us as briefly as you to make your story full, just what you are doing at some of these riment stations.

r. ALLEN. The office maintains quite close and continuous super- ·y and advisory relations with the experiment stations in the ral States receiving the benefits of the Federal appropriation. ıority for this is carried in the provisions in the Hatch act; also ır a clause in the Adams act, which says:

or before the 1st day of July in each year after the passage of the act the tary of Agriculture shall ascertain and certify to the Secretary of the sury as to each State and Territory whether it is complying with the pro- ıs of the act and is entitled to receive its share of the annual appropriation ıgricultural experiment stations under this act and the amount which upon each is entitled, respectively, to receive. * * * And the Secre- of Agriculture is hereby charged with the proper administration of this law.

nd under the authority which is conferred in the annual agri- ural appropriation act, in section 25, which provides:

ıd the Secretary of Agriculture shall prescribe the form of the annual ıcial statement required under the above acts, ascertain whether the ex- ltures are in accordance with their provisions, coordinate the work of the ırtment of Agriculture with that of the State agricultural colleges and ex- ıent stations in the lines authorized in said acts, and make report thereon ongress.

nder that authority we have been, for a considerable number of rs, maintaining an annual visitation or inspection of the experi- t stations in each of the States. A person connected with the ice visits these institutions and spends several days in going over work with the director and with the individual members of the riment station staff and in an examination of the expenditures. s is not a mere auditing of the Federal funds; it is an examination ıe accounts in connection with the work to determine the relation he expenditure to the work which is actually carried on. This gs up frequently the relation of individuals who are receiving eral appropriations to the work of the agricultural college, for uently they are dual officers, in that they teach in the college as as work in the experiment station. Now, on the basis of this rmation which we get out of the annual inspections and on the s of the correspondence which we conduct with the institutions as ssity arises, we are in a position to advise at the beginning of fiscal year what stations are entitled under these laws to receive benefits of these Federal appropriations. We certify these in- tions to the Treasury Department, and on the basis of that fication the warrants are issued. The Secretary of Agriculture at times withheld the appropriation to individual stations because litions were not such as to warrant, in the mind of the Secretary, continuance of the appropriation.

r. HELGESEN. Do you think that the fact that an experiment on did not work harmoniously with a college would be in com- ıce with the law?

r. ALLEN. The experiment station is a part of the college, as it been explained. It is made up of men from different depart- ts of the college. Now, it has got to have harmonious relations ın itself in order to work properly. I do not think that the riment station can not do its work, because it is not working noniously with each department of the college.

[illegible] pathological department of its own

Dr. Arms. [illegible] been done. I will [illegible] of these diseases the pathological department of the whole [illegible] is organized, quite separate [illegible] apply from the experimental department of the experiments [illegible] some might be made of the pathological department [illegible]

Mr. Hitchcock. In that case there would be two [illegible] some one in conflict with the other. Do you think [illegible] complying with the law?

Dr. Arms. I do not think that would necessarily [illegible] with the law. They are not working together. [illegible] own work in the illustration I have given.

Mr. Hitchcock. If they were in conflict, would you [illegible] complying with the law?

Dr. Arms. I think if there is a conflict which affects [illegible] ment station work it is the business of the administrat [illegible] correct that situation. If there is a conflict with or [illegible] with the best results of the station, they are not comply [illegible] law. If it affects the experiment station, I think we ou [illegible] it. If it arises from the experiment station and affects-

Mr. Hitchcock (interposing). For instance, take the [illegible] There are pathological experiments to be made by the [illegible] there are other experiments to be made by the experi [illegible] Now, can you separate those two and get good results? [illegible] diseases are vastly more important to us than any ot [illegible] have to deal with. For instance, if you can not elimi [illegible] these diseases that are affecting the flax industry in our [illegible] have to go out of business. It looks to us as though it [illegible] portant part of the college work, and that anything th [illegible] terfere with it from the practical point of view ought to [illegible] and I am trying to find out whether there is any way of

ng carried on in the college of agriculture by the teachers
e college of agriculture, who have no official connection with the
iment station, and there is no conflict at all. I think it is
y a matter of personality and internal arrangement. If you
a station which works without friction, of course there is no
ct.

. HELGESEN. You refer to the teaching end of it and I refer to
vestigational end of it rather than the other. Well, go on.

e CHAIRMAN. All right, Doctor; go ahead, sir.

ALLEN. As to the details of the administration under the
is Act, it has been mentioned that the work is being carried on
the head of projects. As the Secretary of Agriculture must
mine the legality of expenditures, we attempt to get together
e outset, and the stations submit the projects which are to be
d out along certain lines of work. Of course, we have discus-
at that point frequently, because some projects are not found
suitable and have to be amended, and sometimes they are with-
n.

. ANDERSON. Are the results of experiments at State experiment
ns published in bulletins of the Department of Agriculture, or
ey published as State bulletins?

. ALLEN. They are published as bulletins of the experiment sta-
. Each station has its own series of bulletins or circulars. The
tment has at times summarized certain of the practical results
cover a certain section of the country and issued these as bulle-
As an aid we have for a great many years been compiling in
act form the work of the agricultural experiment stations all
the country, publishing it in the form of a journal known as the
riment Station Record, which enables all the workers to keep
med as to what is going on over the country and after a time to
le to look up the work that has been done on any particular
ct.

. HOWELL. How widely is that circular disseminated?

. ALLEN. It is published in an edition of 7,000 copies. The dis-
tion now covers about 6,800. It is sent to each person connected
the agricultural experiment stations, to every teacher in the
ultural colleges as far as they request it, to the libraries of the
utions, and to the personnel of the State departments of agri-
re and similar official bodies and libraries, but it is not sent to
iduals because the edition will not permit it; that is, individuals
than those having official positions.

. HOWELL. It is rather a valuable publication?

ALLEN. Yes, sir; we are now in our thirty-fourth volume.

. ANDERSON. How does the results of these experiments at these
experiment stations ever reach the farmer?

ALLEN. They reach the farmers in the State in which the work
ie through the publications of that station.

. ANDERSON. That is what I asked you in the first place.

ALLEN. You asked, if I understood you, whether the depart-
published anything.

. ANDERSON. I asked you whether the results were published as
te bulletin or a Federal bulletin.

ALLEN. As a State bulletin.

The CHAIRMAN. And the only publication you make is a compilation of extracts from these publications in that your Experiment Station Record?

Dr. ALVORD. That is all at present. We formerly published in the farmers' bulletins, but that has been discontinued.

The CHAIRMAN. Is there anything further?

Dr. ALVORD. Nothing, unless you wish to ask any questions.

Mr. ANDERSON. I would like to ask another question. The State Relations Service has nothing to do with the experiment stations which are under the Bureau of Plant Industry? It has to do with State experiment stations and the stations that are located in Territories and the island possessions?

Dr. ALVORD. The State experiment stations are provided for by the Hatch and Adams Acts.

The CHAIRMAN. All right; thank you, Doctor.

STATEMENT OF DR. A. C. TRUE, DIRECTOR OF THE STATE RELATIONS SERVICE—Continued.

The CHAIRMAN. Now, Dr. True, we will take up item 93, "To enable the Secretary of Agriculture to enforce the provisions of the above acts and the act approved May 8, 1914, entitled 'An act to provide for cooperative agricultural extension work between the agricultural colleges in the several States receiving the benefits of an act of Congress approved July 2, 1862, and of acts supplemental thereto and the United States Department of Agriculture' and to their administration, including the employment of clerks, assistants, and other persons in the city of Washington and elsewhere; freight and express charges, official traveling expenses, office fixtures, supplies, apparatus, telegraph and telephone service, gas, electric current, and other articles of the District of Columbia," etc. You ask an increase of $[illegible].

Before you discuss that increase, I would like you to discuss what is being done under item 93. As I understand it, that provides for cooperative work under the Hatch Act, the Adams Act the agricultural extension act. Is that correct?

Dr. TRUE. Yes, sir; that is correct under the terms of the item it needs some explanation in detail.

The CHAIRMAN. I understand it; but I was wondering, before you take that up, from what fund will you get the administrative expenses under the Reed Act?

Dr. TRUE. They are not provided for in this item.

The CHAIRMAN. All right, go ahead.

Dr. TRUE. This item provides for all the work which we [illegible] with the agricultural experiment stations. It also provides for the work which we do in this country in relation to the [illegible] Act. It also provides for the work which we do in relation to the Smith-Lever Act. It also provides for the work which we do in relation to the Smith-Hughes Act. It also provides for the work which we do in relation to the Smith-Sears Act. It also provides for the general administrative expenses of the office, and it also provides for the expenses of the [illegible] offices and the supervision of the expenditure of the money carried in that act

. ANDERSON. What amount will be carried under the Lever Act year?
. TRUE. The total?
r. ANDERSON. Yes, sir; under the Lever Act?
r. TRUE. Under the Federal appropriation this present year e will be $1,080,000; next year there will be added $500,000 to
r. MCLAUGHLIN. Pardon me, but are you right about that? Lever Act carried $480,000 and each year $600,000 in addition to year before. The time that you cover there would involve two s, and that would make $1,200,000, and the $480,000 added to would make it $1,680,000, would it not?
. TRUE. Last year we had only $480,000 and this year we have 600,000 in addition to that.
r. MCLAUGHLIN. When you say this year do you mean the year will end on the 30th of June?
. TRUE. Yes, sir; the current year.
r. MCLAUGHLIN. The year ending June 30, 1916?
. TRUE. Yes, sir; and then for the succeeding fiscal year we add $500,000. It is only for one year that the additional nt is $600,000.
r. MCLAUGHLIN. Yes; I was mistaken about that. I presume notice that each one of the members of this committee who s how that law was passed calls it the Lever law and not the h-Lever law?
. TRUE. Yes; and that is very appropriate.
r. MCLAUGHLIN. We know how it was passed.
. TRUE. Yes, sir.
r. MCLAUGHLIN. And how it was framed.
. TRUE. Yes, sir.
r. RUBEY. This committee is very much opposed to its being d the Smith-Lever law. We know it as the Lever law.
. TRUE. That is a matter which I did not decide myself.
r. MCLAUGHLIN. Sure. We have no way of controlling the rtment in the use of words like that, but we have our own opin- and we are very decided on that matter.
r. WILSON. It would please this committee if you would always to it as the Lever law.
r. MCLAUGHLIN. And in your publications conform to the facts.
e CHAIRMAN. Gentlemen, I did not hear all of that.
r. MCLAUGHLIN. It is a good thing you did not.
e CHAIRMAN. All right, doctor; go ahead.
. TRUE. Now, going back to this item 25, on page 171. For the nt fiscal year the total appropriation is $59,500. Of that amount 00 is required for our work in connection with the experiment ns, so that, as far as the administration of the extension act is rned under this item, at present we are able only to do such gen- work as comes under the general administration of the service.
e CHAIRMAN. Now, what further work would you want to do that?
. TRUE. There is a large amount which is to be done and for h temporarily we are making provision as well as we can in the

offices of the extension work. The work, however, is growing, and you will observe that next year, if the States meet their provisions, we shall have a total of $2,080,000 over which we will have supervision.

Mr. ANDERSON. You will have more than that. Under the Hatch and Adams Acts you will have $480,000 and $1,080,000 under the Lever Act, in addition to that the amounts appropriated by the States, is that correct?

Dr. [illegible]. I am speaking now simply of the amounts which will be [illegible] under the Lever Act.

Mr. ANDERSON. Oh, that is all right.

Mr. [illegible]. Pardon me, Doctor, did you say that during the next year, including the amount the States will contribute, you would have $[illegible]? What was your figure?

Dr. [illegible]. $[illegible].

The CHAIRMAN. $[illegible].

Mr. [illegible]. I make it more than that. There is the $480,000 [illegible] without any conditions imposed on the States to [illegible]. Two years have elapsed and each one of those years will [illegible].

Mr. [illegible] aggregating $[illegible] for both years.

Mr. [illegible]. This year will carry $500,000 from the Federal Treasury [illegible] from the State, and this next year that [illegible] the third year, will it?

[illegible]. This is the last Session. This year we have $1,000,000 [illegible] next year we will have a million dollars [illegible].

The CHAIRMAN. The Secretary in his last annual report says that [illegible] the Department funds aggregate $1,200,000 [illegible] under the extension act $1,080,000 is [illegible] the States, the total Federal [illegible] amounting to $[illegible] which must be met with at least $2,000,000 from the States, including $[illegible] to offset the equivalent allotment of extension-act funds [illegible] Federal State appropriations, $[illegible] from college funds, $[illegible] from counties, and $[illegible] from local organizations and individuals [illegible]. The total from both Federal and State sources is more than [illegible].

Dr. [illegible]. Yes, sir; [illegible] the Smith appropriations to the land-grant colleges [illegible] extension work and the [illegible] the States.

The CHAIRMAN. [illegible] the item on the next page of the estimates.

Dr. [illegible]. Yes, sir. Under this item provision should be made for [illegible]. Now, except in a few States, [illegible] that is, the [illegible] extension work, [illegible] the Smith-Lever funds [illegible] the State [illegible] for the [illegible] the State [illegible] in the [illegible] of the Lever funds, so that of this increase is [illegible] extension [illegible].

The CHAIRMAN. [illegible] the States accepted the provisions of the extension act and made their regular appropriations to meet the [illegible] Federal appropriations?

r. TRUE. Yes, sir.
he CHAIRMAN. I wish for the record and for the information of committee and the House that you would give us a tabulated ement of the expenditures for the current fiscal year by States. hat possible?
r. TRUE. Yes, sir.
he CHAIRMAN. Just showing the total amount that is being used the contributions from all sources that are being used coopera- ly with these Federal funds.
r. TRUE. We could get the allotment of the funds, but not the enditure.
he CHAIRMAN. Yes; that will do.
r. MCLAUGHLIN. There might be some confusion in that, because, le this office would handle and distribute to the States only the ey that comes from the Lever fund, the Bureau of Plant Indus- or another authority, handles the money for farm-demonstration k.
r. ANDERSON. Not now.
he CHAIRMAN. No; not now.
r. MCLAUGHLIN. Oh, that is not true now?
he CHAIRMAN. No. We have to confine this statement to the tment of the funds under the extension act for this year and also fund contributed by the States, by the colleges, and by other nizations that are contributing under the law, so as to see the l amount that is being contributed by States.
r. TRUE. That is all here in this publication.
he CHAIRMAN. It is published in your News Letter. I saw it e time ago.
r. MCLAUGHLIN. Will that statement, which is to be made in onse to the chairman's request, include the money that is avail- under these special demonstration appropriations?
he CHAIRMAN. No; but I would ask to have that kind of a state- t apply to these other funds when we reach those items.
r. MCLAUGHLIN. Because I was thinking that some of the money ributed by the States is in cooperation with the Federal Govern- t in its use of these special appropriations as well as cooperative ie use under the Lever fund.
he CHAIRMAN. Do you get Mr. McLaughlin's point?
r. TRUE. No; not exactly.
he CHAIRMAN. Will you repeat that, Mr. McLaughlin?
r. MCLAUGHLIN. Some of the money contributed by the States i cooperation with the department in the department's use of ey appropriated by the Lever Act, and other money contributed he States or by county and local organizations is for use in co- ation with the department in the use by the department of the ey provided by these special appropriations for farm demonstra- work.
r. TRUE. That is all included now under the supervision of the es Relations Service. But the money, a relatively small amount, is spent by the other bureaus——
r. MCLAUGHLIN (interposing). Oh, no; I was not speaking of ey spent by other bureaus. I understand that these large appro- tions of $600,000 for farm demonstration work in the South and

[illegible] $4,000,000 [illegible] in the States [illegible] under the jurisdiction of [illegible] Soils Extension Service.

[illegible]

[illegible] Mr. McLaughlin, I think this statement [illegible] Appropriations [illegible] the amount [illegible] the Department [illegible] Mr. Chairman, I ask unanimous consent to insert in the RECORD at this point [illegible] the statement [illegible] the gentleman from Nebraska [Mr. McLaughlin].

The statement referred to is as follows:

STATEMENT SUBMITTED BY MR. MCLAUGHLIN OF NEBRASKA

[illegible] the Soil Conservation and Domestic Allotment Act [illegible] the fiscal year 1938 [illegible]

[illegible] Soil Conservation and Domestic Allotment Act [illegible] the Soil Conservation and Domestic Allotment Act [illegible] the Soil Conservation and Domestic Allotment Act [illegible] the

	Total for extension work (all sources).	Smith-Lever funds.		Funds in addition to Smith-Lever funds.					
		Federal.	State.	Farmers' cooperative demonstration work, Department of Agriculture.	Other bureaus of Department of Agriculture.	State.	County.	College.	Other.
.....	$97,963	$14,446	$4,446	$7,649	$4,200	.....	$18,306	$48,916	.....
.....	114,253	46,894	36,894	12,981	2,500	.....	.....	14,984	.....
.....	23,742	10,218	218	3,700	.....	.....	5,225	4,380	.....
a....	134,434	25,691	15,691	40,000	11,560	.....	21,442	20,050	.....
.....	63,341	16,167	6,167	6,153	1,350	.....	32,904	600	.....
.....	136,504	31,201	21,201	40,000	10,600	.....	33,500	.....	.....
.....	234,537	45,970	35,970	71,500	5,000	.....	76,097	.....	.....
.....	52,410	12,437	2,437	8,713	1,400	$25,423	.....	.....	$2,000
.....	48,635	12,274	2,274	13,261	.....	5,726	12,000	.....	3,100
.....	130,296	29,272	19,272	39,000	2,800	2,891	28,550	.....	8,511
.....	61,988	16,522	6,522	10,240	1,500	6,604	20,600	.....	.....
.....	121,859	22,071	12,071	25,000	1,260	22,929	25,668	.....	12,860
.....	104,320	26,164	16,164	12,210	.....	33,462	16,320	.....	.....
.....	43,641	11,249	1,249	7,100	1,500	16,751	5,192	.....	600
.....	4,759,151	1,080,000	600,000	925,527	100,380	498,754	943,819	332,837	277,831

[1] Original expressed in cents; totals not adjusted in last unit.

h-Lever offsets, giving sources, as certified to Treasury, fiscal year 1915–16.

ate.	Total.	State.	County.	College.	Local.	Miscellaneous.
.....	$21,491.82	$5,000.00	$15,000.00	.....	$1,491.82	.....
.....	16,678.41	16,678.41	.....	.....	.....	.....
.....	6,486.94	6,486.94	.....	.....	.....	.....
.....	25,173.47	25,173.47	.....	.....	.....	.....
.....	21,088.17	12,000.00	8,088.17	.....	.....	[1] $1,000
.....	14,102.11	14,094.00	.....	$8.11	.....	.....
.....	7,746.73	1,800.00	3,000.00	2,946.73	.....	.....
.....	19,329.35	5,000.00	14,329.35	.....	.....	.....
.....	22,952.65	11,476.65	.....	.....	.....	[1] 11,476
.....	16,255.69	16,255.69	.....	.....	.....	.....
.....	15,691.15	15,691.15	.....	.....	.....	.....
.....	21,201.01	21,201.01	.....	.....	.....	.....
.....	35,969.67	35,969.67	.....	.....	.....	.....
.....	19,271.96	17,109.16	2,162.80	.....	.....	.....
.....	12,071.73	12,071.73	.....	.....	.....	.....
.....	1,715.47	1,715.47	.....	.....	.....	.....
.....	11,037.45	11,037.45	.....	.....	.....	.....
.....	4,792.62	4,792.62	.....	.....	.....	.....
.....	1,397.20	1,397.20	.....	.....	.....	.....
.....	1,279.51	1,279.51	.....	.....	.....	.....
.....	3,108.84	3,108.84	.....	.....	.....	.....
.....	26,282.20	.....	5,400.00	.....	20,882.20	.....
.....	18,931.02	18,931.02	.....	.....	.....	.....
.....	18,781.18	18,781.18	.....	.....	.....	.....
.....	14,555.45	14,555.45	.....	.....	.....	.....
.....	4,388.28	4,388.28	.....	.....	.....	.....
.....	2,930.75	2,930.75	.....	.....	.....	.....
.....	18,032.37	.....	.....	18,032.37	.....	.....
.....	14,898.99	14,898.99	.....	.....	.....	.....
.....	23,034.17	23,034.17	.....	.....	.....	.....
.....	2,950.01	2,950.01	.....	.....	.....	.....
.....	10,715.89	10,715.89	.....	.....	.....	.....
.....	832.94	832.94	.....	.....	.....	.....
re.....	2,133.46	2,133.46	.....	.....	.....	.....
.....	7,659.22	7,659.22	.....	.....	.....	.....
.....	23,442.72	23,442.72	.....	.....	.....	.....
.....	3,413.20	3,400.00	13.20	.....	.....	.....
.....	6,247.19	6,236.00	11.19	.....	.....	.....
.....	25,556.54	25,556.54	.....	.....	.....	.....

from Western State Normal School and $500 from Eastern State Normal School.
ropriation of State Department of Agriculture.

[illegible] sources, as certified by [illegible] 1915-16—Continued.

[illegible]	Total	State.	County.	College.	Local.	[illegible]
[illegible]	$[illegible]	$[illegible]	$[illegible]	$[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		

[illegible] by counties, for cooperative agricultural extension [illegible] fiscal year 1915-16.

[illegible]	Total	Administration	Publications	County agents.	Home demonstration.[1]	Movable schools.	Boys' club work.[2]	Pig clubs.	Poultry clubs.	Livestock.
[illegible]	$[illegible]	$[illegible]	$[illegible]	$[illegible]	$[illegible]	$2,400	$[illegible]	$2,500	$[illegible]	$[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[

of funds, by projects, for cooperative agricultural extension work for the fiscal year 1915–16—Continued.

tes.	Dairying.	Agronomy.	Horticulture.	Plant diseases, insects.	Agricultural engineering.	Farm management.	Marketing.	Rural organization.	Miscellaneous specialists.	Exhibits.	Other.
	$2,800	$2,760			$1,600		$1,050	$500	$1,550		
											$5,410
							900		11,890		
											2,416
						$2,700			6,870		235
	2,600					2,811					
	2,300										99
	600										
	4,880	7,000								$1,900	2,400
	500	500	$1,600								
						2,800			8,000		200
	7,750	5,700	4,800	$2,500		5,000					1,200
	8,180	11,875	3,000		3,675	3,650		1,600			22,798
	1,410	2,666	1,416	850	9,999	1,900		3,000			16,980
	1,790	950	2,720					750			
									11,500		
	2,820	1,650				2,200					
	1,320	1,500	2,250	2,200	440	2,500		600			
	1,200		3,033			2,490		5,275		500	3,618
		3,664	5,423	1,700		2,600					2,300
	3,800					14,930					
	7,140		1,300		1,500	1,500	2,300	1,400			3,000
	3,400		3,200	2,900	720			3,200	2,150		7,800
	3,000					2,600					
	3,550	1,900	2,475		1,900	8,390					
	2,600								1,500		274
	1,500		4,200			1,320					
	950	600	3,170								5,028
	3,000										
	11,800	8,430	6,250	11,650		6,990			12,250		2,220
	13,280	3,300	2,500	400	2,400		3,000				
						5,930					
	3,300					3,670			8,790	750	
	2,620										5,172
	5,400					2,760		4,141			7,007
	8,260		3,810			3,960				2,000	
		1,350									
	7,060	2,100	2,200				3,000				3,800
	2,700										300
	5,300	2,800		700				2,900			1,200
	2,900				1,300	4,900		9,100			
	2,800	2,250				2,600			5,245		1,750
	35					1,960				1,565	
	780		3,100		1,700						1,600
	5,500			2,100		2,800					
	2,604										9,280
	4,000	9,050	2,000	2,950	4,800	2,840					
	3,000									200	1,150
	148,429	70,045	58,447	27,950	30,034	95,801	10,250	32,466	69,745	6,915	107,247

AIRMAN. Doctor, I notice in your item there you provide t and express charges. What freight or express charges ur in the administration of this work?

E. Incidental freight and express charges. If you will tell it is I can explain it better.

AIRMAN. It is in your item here, beginning with 25, just first statement in figures of the amount. It says "other the city of Washington and elsewhere, freight and express fficial traveling expenses," and so forth.

E. It is necessary to have that in there because, of course, eneral overhead offices we have to buy supplies of various

AIRMAN. And that would include the freight?

Dr. TRUE. Yes, sir. That language has been carried in the bill for [illegible]

Mr. HAUGEN. Yes. I was just wondering what it meant. Now, [illegible] "For farmers' cooperative demonstration [illegible] work in the several States, including the employment [illegible] of Washington, and elsewhere, supplies, and [illegible] necessary expenses, $775,240." That item stands as it [illegible] with that you have added the words "in extension work" [illegible] "demonstration and extension work" in [illegible] What does that new language? Is it to [illegible] what you are really doing?

Dr. TRUE. It is to avoid the misunderstanding with regard [illegible] that we carry on always necessarily a demonstration work more broadly than is indicated by the [illegible] and so to avoid any question about it we [illegible] added in this item.

Mr. HAUGEN. What extensions are suggested here by the legislation? What is necessary in the way of extension?

Dr. TRUE. Extension work?

Mr. HAUGEN. Are there any new extensions that you have in mind?

Dr. TRUE. We [illegible] example, this: We are carrying on a line of [illegible] demonstration in farm management," and I put [illegible] appropriated for demonstration outside of [illegible] for that purpose. Now, that includes what [illegible] called "demonstration work."

Mr. HAUGEN. Demonstration is one thing and extension is another. [illegible] taking up or adding to what you have [illegible] that extension means a new line of work—a [illegible]

Dr. TRUE. We do not use the term in that sense. By extension [illegible] in the Lever Act, the giving of practical [illegible] to the farmers. It may be new work [illegible] new to extend. But necessarily we will have to [illegible] things for a number of years until the farmers [illegible] of them.

Mr. HAUGEN. What have you in mind? What is this extension [illegible]

Dr. TRUE. It involves going out to give this information and practical [illegible]

Mr. HAUGEN. You give the information by demonstration. That is the way of giving information, is it not?

Dr. TRUE. Yes, sir; but it may also be given by getting the farmers together and explaining to them certain things.

Mr. HAUGEN. You demonstrate to them exactly what you can do and what your invention or discovery is?

Dr. TRUE. Yes; we show them that, but the proposition that I have in mind is this, Mr. Haugen, that under the Lever Act this work is spoken of as extension work. Now, we can not practically make a separation of demonstration and extension work, and so we desire in this item to have the language comprehensive enough to include all the lines of work in which we are actually engaged.

Mr. HAUGEN. What I had in mind was this: Have you any new line of work under consideration, or are you contemplating any new

of work other than what is being carried on now by the States by your deparment? Is there anything in particular that you have in mind?

r. TRUE. One particular thing that is being arranged for now, operation with the Bureau of Plant Industry, is some special nsion work in plant diseases. The Bureau of Plant Industry worked on certain wilt-resistant plants, and they think that work reached a point where the information can be properly taken to the farmers. They come to the States Relations Service and us to take up that work, and we enter into arrangements with colleges to carry on extension work along that line.

he CHAIRMAN. As a matter of fact, Dr. True, the department is using, and has been using for some time, the word "demonstion" and the word "extension" interchangeably as being synonys words?

r. TRUE. Yes, sir.

he CHAIRMAN. And all you are proposing here in this item is to w that that is the fact?

r. TRUE. Yes, sir.

he CHAIRMAN. But is this additional language absolutely neces to the life of this work?

r. TRUE. It seems to me much better that it should be there, be se then there is no doubt in the mind of anybody as to the author we have.

he CHAIRMAN. Has anybody with authority to do so ever ques ed that authority?

r. TRUE. No, sir.

he CHAIRMAN. It seems to me that the addition of the language ld simply be provocative of discussion and not accomplish any d.

r. MCLAUGHLIN. As I look at it, I can hardly agree with the rman, as it seems to me that the appropriations in items 26 and re made rather to supplement the work named in the Lever Act, hat the work ought to be practically the same. One of these s it is to be hoped that it will not be necessary to make these sepa appropriations and that there will be money enough under the er Act for all practical purposes, or at least as far as the Govnent wants to go. It would look to me that these lines of work, ey have been different, ought to be brought together pretty soon.

he CHAIRMAN. Well, as a matter of fact, in their practical opera in the department they have been brought together. Is that , Doctor?

r. TRUE. They have been brought together.

he CHAIRMAN. I think probably, if you want to change the lange at all, it would be better to change the word "demonstration" extension," and then you would have it absolutely in line with extension-act language—if you want to change it at all.

r. HELGESEN. What item are you on now?

he CHAIRMAN. Item 26.

r. HAUGEN. What I had in mind was this: That probably it ht be interpreted to mean excursions into new lines that possibly ht not be profitable and might possibly lead us into something we did not want. I am rather jealous of the prerogatives of this

committee and of Congress. I think the Congress should preserve a few of its rights.

Mr. HELGESEN. I was called out for a moment, Doctor. What is it that you have brought together?

Dr. TRUE. We have brought together what is technically called the demonstration work and what is known under the Lever Act as extension work, and we want the language of these items changed so that it will be plain that we are engaged in both kinds of work.

Mr. HELGESEN. I notice in item 26 that you have farmers' cooperative demonstration. In what way do you cooperate with the States in that item?

The CHAIRMAN. The same language is in both items, Mr. Helgesen.

Mr. HELGESEN. Yes; but they are not in the same appropriation.

Dr. TRUE. Mr. Chairman, I think you would like to hear from Mr. C. B. Smith, who is in charge of that work.

Mr. ANDERSON. Before Mr. Smith takes up that item I would like to ask a question. There is an apparent decrease in this item of $15,000. Where is there in the situation of demonstration work in the colleges which justifies a decrease in this appropriation?

Dr. TRUE. There is no reduction, really. That simply comes because of the transfer of certain clerical employees to the statutory roll for the law which requires us to do that.

Mr. ANDERSON. Doctor, everybody who has appeared before the committee before this time has contended with all the force and energy and mental gymnastics of which they were capable that in every case where there was a transfer there was an actual decrease in the item. Now, you are attempting to tell us something exactly different, exactly the opposite of that.

Dr. TRUE. I do not understand that. Of course, there is a decrease in the item as it is carried in the appropriation act, but the amount of money covering that decrease has been transferred to the statutory roll, so that the money available for use under this item will be just the same.

Mr. ANDERSON. I do not understand that, I am frank to say.

Dr. TRUE. Here is the proposition: If you have $50,000 that you are spending for a certain thing this year, and out of that $50,000 $5,000 is being spent for the salaries of clerks, and next year we have $45,000 for that purpose and $5,000 in the statutory roll, that makes $50,000 just the same carried in the two items.

Mr. MCLAUGHLIN. I think I understand it. These clerks mentioned here have been paid out of that $386,000. Hereafter they will be paid out of another fund.

Dr. TRUE. They will be on the statutory roll.

Mr. MCLAUGHLIN. And that lump fund is reduced the amount of their salaries, but the same amount of money actually used for that work would be available for the work carried on under this appropriation?

The CHAIRMAN. The statutory roll would be increased by that amount.

Dr. TRUE. That is right.

Mr. MCLAUGHLIN. Is that plain, Mr. Anderson?

Mr. ANDERSON. I do not think so, but I will pass it up. It is too much for me.

The CHAIRMAN. Pray over it to-night.

ELGESEN. If that is true, why is not the same provision made
umber 27?
CLAUGHLIN. Now, if you remember when we considered the
this bill which provide for transfers of clerks and the conse-
crease of the amount on the statutory roll to pay their sala-
asked in each case whether a corresponding reduction had
de in the appropriation out of which their salaries were
paid, and the gentlemen appearing before us answered,
was a fact, that the corresponding reduction had been made,
e is some criticism of them if we find that it has not been
Now, we find that, while they have increased the appropria-
he statutory roll, they have made the corresponding reduc-
his appropriation.
NDERSON. That is very true, but in almost every instance they
led something to take the place of it.
UE. But we have not done that in this case.
NDERSON. I am not complaining. I am simply trying to
rate the fact that in practically every instance where trans-
been made some other line of work is provided, so that the
iation does not actually decrease, but it very frequently in-
and the net result of it is to have more people on the roll
have now.
HAIRMAN. That may be true as a general proposition but
ot true as to your item, is it, Doctor?
UE. No, sir.
CLAUGHLIN. I am very much pleased to know that this
whatever is to be available, will be used more largely for
work than administration.
NDERSON. I do not see how you draw that conclusion.
OWELL. In your preceding section you provide an increase
0. That will necessarily mean an increase in the lump-sum
S.
UE. Yes, sir.
OWELL. So that the number of lump-sum employees will be
large or larger than they were before.
RUE. That does not necessarily follow. Of course, if we
get more money, after you gentlemen have passed upon the
then we will have more money for extra people.
OWELL. Then the $25,000 in the preceding item would permit
oyment of a good many additional men.
UE. A number.
ILSON. Where do you get these extra employees? Have you
le list or roll?
RUE. We get them through the Civil Service Commission.
ur business has to be done through the Civil Service Com-

OWELL. I did not know whether they would be temporary
s or whether you had an eligible list.
NDERSON. It appears that $70,000 was spent during last year
nistrative work under item 26, which carried approximately
Now, why does it take $70,000 to administer that item
took a very much less sum to administer the provisions in
r Act, the Hatch Act, and the Adams Act?

Dr. TRUE. For this reason: That the money under the experiment station and extension acts is not handled directly by the department. It goes to the agricultural colleges and they administer it directly, so that we need only a small force at small expense to look after that general supervisory work that we have to do in connection with those funds.

Mr. ANDERSON. How many men are employed in Washington out of the fund for farmers' cooperative demonstration work in the North?

Dr. TRUE. In the North and West there are 29.

Mr. ANDERSON. What is the character of the work done by these men?

Dr. TRUE. I can explain that in general, but I thought the chairman desired Mr. Smith, who is in charge of that work, to explain the item we are now on.

The CHAIRMAN. We would like Dr. Smith to take charge of this matter at this point.

Dr. TRUE. Mr. C. B. Smith is the Chief of the Office of Extension Work in the North and West.

STATEMENT OF MR. C. B. SMITH, CHIEF OF THE OFFICE OF EXTENSION WORK IN THE NORTH AND WEST, STATES RELATIONS SERVICE.

The CHAIRMAN. Tell us what you are doing in this work, what results you are accomplishing, and so on.

Mr. SMITH. Of the $386,000 that you gave us last year for this work, we are this year putting $265,000, in round numbers, into what we call county-agent work, about $57,000 into boys' club work and girls' club work, and approximately $40,000 into our farm-management demonstration work. Both of the last items are in support of the county-agent work.

The CHAIRMAN. Now tell us about your county-agent work.

Mr. SMITH. The general plan of that work as we have been carrying it on now for the past three or four years in the Northern States is to have a man located in the county to deal with the agricultural problems of the county directly with the farmers. That plan has been accepted by the States and is being adopted by all of them, and as fast as the money is available under the Lever Act they are putting the county-agent plan into effect.

Mr. ANDERSON. Let us understand that right here. Now, as I understand you, you say the States are using the funds which are appropriated under the Smith-Lever Act?

Mr. SMITH. The Lever Act.

Mr. ANDERSON. Yes; the Lever Act; excuse me. You say you are using those funds for the purpose of employing county agents. Now, you are using the funds under this act?

Mr. SMITH. Yes, sir.

Mr. ANDERSON. For the employment of county agents?

Mr. SMITH. Yes, sir.

Mr. ANDERSON. Now, I want to know if the county agent under this act is the same person as the county agent employed by the States. Do you contribute to the same agent, or do you have different agents?

Mr. SMITH. The department and the State have the same agent, ne and the same agent, for two reasons: At the very outset, when 'ongress gave the money for this work to be initiated in the North, ıe work was taken up and carried on in cooperation with the col-ges, whether they had any money or not, and when they did get ıe money the two forces united and the work is now cooperative in ıe States.

Mr. HOWELL. This is merely a supplemental appropriation to the ever Act?

Mr. SMITH. Yes, sir. The county-agent plan originated in the De-artment of Agriculture. The Lever Act is the outgrowth of the)unty-act plan.

Mr. HOWELL. That is what I understand. This work was the fore-ınner of the Lever Act. When the money was appropriated by the tates it was thought that this money would not be necessary.

Mr. SMITH. It was necessary to go to the States to show them just hat it was in order to get their support and influence in this work.

Mr. HELGESEN. Now, in connection with this item No. 26 it was xplained a while ago that certain employees were taken off of the ımp-sum roll and put on the statutory roll.

Mr. SMITH. Yes, sir.

Mr. HELGESEN. Under item 27 there is a small note stating that here clerks or employees have been taken from the lump-sum roll nd put on the statutory roll there is an apparent decrease. Now, oes that decrease in item 26 cover both of those notes?

Mr. SMITH. No, sir. The decrease only covers the $378,000 item. lerks and employees have been transferred from that item to the tatutory roll. The $386,000 has been decreased to $378,000.

Mr. HELGESEN. Why don't you decrease the other item?

Mr. SMITH. Dr. Knapp will explain that item.

The CHAIRMAN. They did decrease it from $666,000 to $661,000.

Mr. HELGESEN. Now, item 26 is for farmers' cooperative demon-tration work and extension work outside of the cotton belt, includ-ng the employment of labor in the city of Washington. Does that pply only to the continental United States, or does it include all the erritories and outlying possessions?

Mr. SMITH. It applies to the 33 Northern and Western States.

Mr. HELGESEN. In what way do the States under this item cooper-te with you?

Mr. SMITH. In county-agent work they may put up a part of the noney directly from the college and we put up a part of the money nd the county puts up a part of the money to employ a man that ve call the county agent.

Mr. HELGESEN. You say they may do that. But do they do it?

Mr. SMITH. Yes, sir; they do.

Mr. HELGESEN. Do you do cooperative work in this district unless certain amount of money is put up by the county or the State in ooperation with you?

Mr. SMITH. Rarely so; if it is an entirely new district, that may e done. That was more particularly so two or three years ago, when he States did not have money in this work. Now that this money s available for them, they cooperate financially with us in every nstance.

Mr. HELGESEN. To what extent?

Mr. [illegible]. The State and the department usually [illegible] for [illegible] The State puts up half of it [illegible] each one is $600, enough that may [illegible] to meet the different [illegible] the Federal States.

Mr. [illegible]. Is that the general proportion?

Mr. [illegible]. We sometimes put in only a very little [illegible] almost in the matter—that is, it comes [illegible] and we can get the same result [illegible]

Mr. [illegible]. The State or county sometimes puts in the [illegible]

Mr. [illegible].

Mr. [illegible]. Not enough in it to get [illegible]

Mr. [illegible].

Mr. [illegible] the agent who selects him [illegible]

Mr. [illegible]. [illegible] agreement with the department. The [illegible] a State leader to [illegible] a memorandum that we have [illegible] agent in charge and [illegible] superior officers, who [illegible] the college and the bureau [illegible] department here in Washington.

Mr. Haugen. Is that leader generally the director of the State experiment station?

Mr. Smith. No; not usually. In perhaps a half dozen States he is the extension director and also the State leader.

Mr. Haugen. Is that the case in North Dakota?

Mr. Smith. Yes, sir; that is the case in North Dakota.

Mr. Haugen. How are they selected by this State leader, as you call him?

Mr. Smith. He tries to find men that understand the science of agriculture and the practice of agriculture. In a large measure he takes the graduates of the institutions who have remained in the State and who have made a success in the practice of agriculture. Then he proposes them to his superior officer as men competent to carry on that work. He usually takes that agent down to the county where he is going to be employed and lets the local people look him over and see whether or not he is acceptable to them. So that his employment is the joint action of the county, the State, and the department. He must satisfy all three.

Mr. Watson. They are not under the civil service?

Mr. Smith. No, sir.

Mr. McLaughlin. In one of the counties in my district I think two men were suggested to the State leader before a man was found satisfactory to the county. I think the satisfactory man was the third man.

Mr. Smith. Those, in general, are the qualifications that are looked for—that he should know the science of agriculture as taught in the college.

Mr. Haugen. How about the practical side of it?

Mr. Smith. He must know the practical side of it; we let the farmers in that community largely judge of that thing.

Mr. HAUGEN. How many of these graduates of colleges have any knowledge of agriculture? Do they generally come from the farms? Do they have an opportunity to get practical experience, or do they come from the cities?

Mr. SMITH. It is against the practice of both the department and the colleges to take men fresh from the colleges and put them into this work. They are not ready for it. Usually two years on some farm is necessary before they can take charge of that work. In some States five years in farm work is required before they can take charge of it at all.

Mr. STEELE. Now, Professor, when you or the State have selected this man, what supervision have you over this work? What is necessary—that the Government should go there and expend the money and see that he gets up in the morning and goes out on the farm and instructs these farmers correctly?

Mr. SMITH. The whole matter of the proper organization and conduct of county-agent work is yet in its formative stages. A lot of help would be given to the county agent or the State leader in just showing them how to begin their work. A county agent has had no training in this kind of work heretofore. It is an unknown field to him. The colleges have not trained him. You just take him on his history—what he has done in other lines of work—and you put him into that county and tell him to get into touch with those farmers and do certain kinds of extension work.

Mr. ANDERSON. You speak of organization work. Do you mean the organization of cow-testing associations?

Mr. SMITH. If that is necessary. The county agent's business there is to bring to that county everything appropriate to the locality. If they need a cow-testing association there, he will help them organize it; if they need a cooperative marketing association, he will help them to organize that; and if they need a breeding association, he will help them on that. The one big thing that he needs, as we are finding it in the North with the diversified agriculture, is to have a good organization of farmers behind him, supporting him in that work and helping him to shape up the work itself.

Mr. HOWELL. Do these county inspectors make reports to your department on the program proposed?

Mr. SMITH. They do.

Mr. HOWELL. How often?

Mr. SMITH. Once a week; we get their weekly report.

Mr. STEELE. As to your initial organization; the man who selects these men—is he not an organizer?

Mr. SMITH. Yes, in part; he ought to be a good organizer.

Mr. STEELE. Your State leader?

Mr. SMITH. He is a man who ought to go out first and help organize the county for a county agent, explain to the county what that work means, help them organize, help them raise their money, and outline proposed plans of work for that agent when he gets onto the job; and that is a big task, because most of the State leaders are yet feeling their way in that.

Mr. HELGESEN. You say that leader is appointed by the department?

Mr. SMITH. Cooperatively employed by the State and the department; they agree on that man.

Mr. HOUSTON. Do you know how the [illegible] stations are appointed?

Mr. [illegible]. I do not [illegible]

Mr. WILSON. What salaries [illegible]

Mr. [illegible]. It varies from [illegible] average between $1,500 and $2,[illegible]

Mr. [illegible]. Is it not a fact that [illegible] additional fund so that he got [illegible]

Mr. [illegible]. That is the average [illegible] there are some upon a connected [illegible] per month, $1,000 a year. The [illegible] more than a part of his salary.

Mr. WILSON. Are these men [illegible]

Mr. [illegible]. They are alive [illegible] all of them.

Mr. HOUSTON. These leaders are appointed [illegible] the State and the Department of Agriculture?

Mr. [illegible]. Yes; the State college of agriculture [illegible] recommendation to the leader who shall have charge [illegible] within the State.

Mr. HOUSTON. What do you mean by the "State college of agriculture"? Do you mean the board of directors [illegible] who?

Mr. [illegible]. Usually we think of the president of the college as being connected with the college, but sometimes he is [illegible] of the board.

Mr. HOUSTON. You recognize the board, then, if occasion arises, to make a report to the president of the college?

Mr. [illegible]. I suppose that is the legal corporation.

Mr. MCLAURIN. The question asked as to the kind of men [illegible] my own State. They have a leader there, [illegible] gentleman, and I know a number of [illegible] case I believe he is a graduate of the [illegible] Michigan, and up to the time of his [illegible] engaged in farming, running his own farm. [illegible] have been selected, and it has been [illegible] who are capable of that kind of work and [illegible] do, having their own farms, are [illegible] the money that is paid; and I am [illegible] to go on, some day—and pretty [illegible] more money.

[illegible] double benefit out of it. Mr. M[illegible] st, they have their salary; and [illegible] themselves available to them, at their [illegible] my county, one of [illegible] two years ago [illegible] county [illegible] and he was [illegible] most [illegible] with Dr. K[illegible] the [illegible]

Mr. MCLAURIN. [illegible] Lever Act [illegible] Secretary of Agriculture [illegible] of the work to be carried [illegible] a project, and it must be approved

the Secretary of Agriculture. Then the State is told to go to rk and carry out that project. The State leader is constantly in ch with the county agents, and very often, in larger meetings at st, some gentleman from the Department of Agriculture appears d takes part. It was my privilege during this last summer (and in er years, so far as I have had time) to attend meetings where the rmers were gathered together and be talked to and advised and in-ucted by the county agent, and in almost every instance the State der was there, and often men from the agricultural college and casionally from the department. It is, of course, a difficult mat-r for the department, so far away, to direct the particular work at a county agent shall do, but all the information, advice, and in-ruction available at the Department of Agriculture and at the gricultural college is ready for the use of the State agent and each unty agent.

Mr. HELGESEN. Do you know who is responsible for the amount of oney that is called for in each of these items—who determines the nount that the department wants for this work?

Mr. SMITH. This committee.

Mr. HELGESEN. But we have an estimate put up to us.

Mr. SMITH. This $368,000?

Mr. HELGESEN. Yes.

Mr. SMITH. Dr. True is responsible for that, I suppose.

Dr. TRUE. Mr. Chairman, once a year, in consultation with the iefs of the different branches of the work, we determine what nds we think ought to be asked for for the work of the ensuing fiscal ar. All those estimates are submitted to the Secretary of Agri-lture, and he determines the amount as it is put in the Book of stimates.

Mr. MCLAUGHLIN. The only criticism I have of this entire propo-tion is the amount of money that is spent for administration. For veral years the gentlemen from this department have told us of e results of their work, what they had learned, and how ready and ell prepared they were to take the results of their work to the rmers, so that it could be understood and made readily available. he inference was that they had reached the point where it was cessary to have money for practical work, and when an appro-iation was made for practical work here, we find $70,000 out of 86,000 used for administration, and $90,000 out of $661,000 used r administration. I had occasion to speak of that on the floor of e House the other day, when we were discussing that road bill, with e view of limiting the amount of money that could be used for lministration, because that bill provided for the employment of in-ectors to go over this country and to look at and inspect and report n each and every separate road that was being constructed in co-peration with the States before any money provided in that act ould be paid by the Secretary of Agriculture to the States; and I ill think that too much of this money appropriated for practical ork is spent in administration.

The CHAIRMAN. Doctor, we can not complete your statement to-ay, but I wish you would keep in your mind the suggestion of Mr. IcLaughlin when you resume your statement and be prepared to ell us in detail just what those administrative expenses are, and

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

STATEMENT OF MR. C. J. SMITH, CHIEF OF THE DIVISION OF FOREST INSECT INVESTIGATIONS IN THE NORTH AND WEST STATES AND PACIFIC STATES. Continued.

[illegible]

Mr. SMITH. [illegible] 1924. That includes the overhead supervision [illegible]

Mr. HELGESEN. Does that include both items 26 and 27?

Mr. SMITH. No, sir. It covers only item 26.

The CHAIRMAN. Read into the record the statement you have to make.

Mr. SMITH. Replying to Mr. Helgesen, it involves the overhead supervision of the work in the Northern and the Western States. The allotment of $15,000 is made up of the items as per the schedule I have handed to you.

Mr. ANDERSON. Are there only three men employed in Washington?

Mr. SMITH. No. I will explain that a little further.

There is the overhead force that supervises all of the work, and it may be called clearly an administrative force. The other men I shall speak of are engaged in different project work and are mostly in field work, and I have included their expenses under those projects.

This item, you will notice, includes a reserve of $4,914. That later in the season may be spent on some definite project or piece of work out in the field.

I do not know whether there are any questions that you want to ask in regard to that.

The CHAIRMAN. I ask, gentlemen, at this point that this statement of Mr. Smith's may be included in the record.

(The statement referred to follows:)

Allotment of funds for overhead expenses of the Office of Extension Work in the North and West for the fiscal year 1916.

ADMINISTRATION.

Items.	Statutory salary.	Lump fund.		Total.
		Salary.	Expenses.	
Chief of office		$3,250	$900	
1 clerk		1,000		
1 special agent (Assistant Secretary's office)		3,000	600	
Records, accounts, supplies, etc.:				
Statutory roll (11 employees)	$10,620			
2 charwomen		480		
1 messenger		360		
Supplies			8,900	
Telegraph, telephone, freight, etc			800	
Reserve			4,914	
Total administration	10,620	8,090	16,114	$34,824

PROJECT WORK—WASHINGTON FIELD STAFF.

Items.	Statutory salaries.	Lump fund.		Total.
		Salary.	Expenses.	
COUNTY AGENT WORK.				
Field staff:				
11 Eastern States:				
Agriculturist in charge		$3,000	$1,000	
1 assistant		1,980	1,000	
11 Central States:				
Agriculturist in charge		2,520	1,000	
1 assistant		2,500	1,000	
1 assistant		2,100	1,000	
11 Western States:				
Agriculturist in charge		2,280	1,200	
1 assistant		2,220	1,000	
Clerical staff:				
1 clerk		1,200		
1 clerk		1,000		
2 clerks	$2,400			
Total, county agent work	2,400	18,800	7,200	28,400
BOYS' AND GIRLS' CLUB WORK.				
Field staff:				
Agriculturist in charge		3,000	1,200	
1 assistant		2,400	1,200	
1 assistant		2,000	1,000	
Clerical staff:				
1 clerk		1,000		
3 clerks	3,400			
1 laborer		300		
Reserve		433.75		
Total, boys' and girls' club work	3,400	9,133.75	3,400	15,933.75
FARM-MANAGEMENT DEMONSTRATIONS.				
Field staff:				
Agriculturist in charge		2,760	1,000	
1 assistant		1,800	1,000	
1 assistant		1,800	900	
1 clerk	1,200			
Total, farm-management demonstrations	1,200	6,360	2,900	11,460

TOTAL OVERHEAD EXPENSE FOR PROJECT WORK.

Lump fund	$47,793.75
Statutory salaries	7,000.00
Grand total for three projects	54,793.75

Mr. SMITH. Are there any questions on this statement? Have you looked it over sufficiently?

Mr. ANDERSON. That is merely on this one item of overhead expense. You expect to go into this project later?

Mr. SMITH. Yes.

Mr. HERSEY. What is this amount by statutory roll—$[illegible]?

Mr. SMITH. That means we have a force of 11 clerks that are employed—general clerks, accountants, stenographers, property clerk, messengers, etc.

Looking at the project work, you will notice that there are three projects: First, county-agent work, and that is subdivided; second, boys' and girls' club work; and, third, farm-management demonstrations.

You will notice in that statement the Washington force for the administration of those separate projects and that may need some explanation.

First of all, there is the county-agent work. The force that is administering that work in the 11 Eastern States are Mr. Clinton and Mr. Wilder; and then for the Central States there are two men definitely provided for and a prospective assistant. These estimates were made last July in the projected work. Then, in the Western States there are two men working on that project, and they have their headquarters in Washington.

Mr. ANDERSON. What is the character of the work done by these men? Is it supervision of the county agents or scientific research work, or what is it?

Mr. SMITH. It is the development of the organization of the cooperative extension work with all the States. It is supervisory as well as direct field demonstration work; not experimental work, but demonstration work. These men go into the field and show a State leader how to organize a county for county-agent work, for boys' and girls' club work, or for anything of that kind that will assist him in making effective the extension work in that State.

Mr. ANDERSON. Then your organization runs like this: You have a State agent who tells the county agent what to do and how to do it?

Mr. SMITH. Yes, the State agent, who may be new to this work.

Mr. ANDERSON. Yes; I understand.

Mr. SMITH. And he, at the start, brings to the county certain information on the organization for the work.

Mr. ANDERSON. Then you have a scientific force in these different divisions?

Mr. SMITH. Yes.

Mr. ANDERSON. Who instruct the State leaders?

Mr. SMITH. Yes, sir.

In further explanation of that work, I may add this: While these men are placed under the county-agent work, their work is far greater than that. This is the office through which the States Relations Service administers the Lever Act and all of the cooperative extension work done in the Northern and Western States, and that involves this year more than $1,500,000.

Mr. ANDERSON. Your overhead for that item is contained in a specific appropriation?

Mr. SMITH. Only partially; and when this was made up there are practically no funds for that work.

UE. The small appropriation that was carried for general ative expenses is used in connection with the office of the or the more general purposes.

DERSON. Is there ever any way of finding out exactly what ead charges of any particular bureau or department is?

UE. I think so.

DERSON. I have never seen it. We had up this item the for the overhead administrative expenses of the Lever Act y recollection—I may be inaccurate about it), and I asked on as to whether that item covered all of the administrative of the Lever Act, and the answer to that question was in ative. We are finding that there are some $70,000 more or ional administrative expenses.

ITH. Only a part of these men are working on what may be ministrative Lever extension matters. They are giving the eir time to their particular project work. Nevertheless they presentatives out in the field who are helping to administer ension matters, and they are the men in the office who handle te extension projects when they come in for the depart- proval.

DERSON. Of course, there is always the question of what ed in the overhead expense. The Government very un- ly, it seems to me, has no system of cost accounting, if you it such, or system of charging the expenses in such a way possible to ascertain with very great definiteness just what ead is. But it seems to me in an item of this character, for demonstration and extension work, that everything that touch the farmer directly is an overhead charge; and I e to get at just what the expense is of administering these cts. including the force in Washington, your supervisory l including your different district agents, your State agents, . That is what I would like to get at.

ITH. That is difficult always to do.

JE. I was going to say this, that in the general consideration natter you have got to take into account certain features o this work. As the work is organized, we are engaged in nplicated work, because this appropriation that is made for rs' cooperative demonstration work, in its actual operation, rily closely associated with all the other activities that come head of "extension work." That includes the expenditures Lever Act and also all expenditures that are made within s from all sources, as well as those that are made by the nt. That is a very large enterprise. We think that in the f that business it is better that the men who go out from on into the States should not be simply an administrative the technical sense of that term, but should be thoroughly cientists and technical men along the lines of our various , in order that when they go into the States they may con- finitely to the actual work among the farmers.

DERSON. I think that is true to a certain extent, Dr. True, e an impression that we get more for our money if we do ore practical demonstration work and a little less scientific

Dr. TRUE. I am not thinking of these m
oretical lines. They are men who have ha
also know what science teaches on these
familiar with agricultural practice, and w
with this extension force and what we thi
Federal and the State legislation relating t
bring to bear in the States the informatio
which has behind it the backing of science.

Mr. ANDERSON. I think I can state in a
are trying to get at. What we want to kn
money that we are appropriating actually
how much of it is dissipated in administ
another? That is what we are interested i

The CHAIRMAN. You would not admit,
was "dissipated," would you?

Dr. TRUE. No, sir.

Mr. ANDERSON. How it is used, then?

The CHAIRMAN. We would like to have t
as possible.

Dr. TRUE. That is what I was trying to d
in our Program of Work, and we think th
is included under the project statements is
mation directly to the farmer.

The CHAIRMAN. And that raises the qu
complicated an extensive organization as
necessary in order to accomplish that resul

Dr. TRUE. We, of course, think that the
building up and using is essential to the bes

Mr. HELGESEN. I do not know whether
and I do not know that I can state it any b
does. What I think he is after is to ascert
money expended in field work by field men
for administrative and simply advisory wo

Mr. SMITH. Let me illustrate how diffi
Right here, under the project boys' and gi
by Mr. Benson, there are three items. T
the field 317 demonstrations, standing n
showing them how to can things or how to d
with the boys and girls around them. Tha
to teach the State leader how to do that wo

Mr. HELGESEN. That is the exact informa

Mr. SMITH. I have got it here under "
work, and it is difficult to separate it. Th
they do: they also follow up all kinds of d
going to help organize it in the States.

Mr. HELGESEN. You undoubtedly have a
who do not do this kind of work but who c
work. If that was separated from the othe
you can go.

Mr. MCLAUGHLIN. I want to ascertain if
correctly. The Lever Act itself provides n
tion? That money must be provided other

Mr. SMITH. Yes, sir.

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r. McLAUGHLIN. In connection with the Lever Act, you are using $661,000 in the cotton States and $386,000 in the States of the h. Out of that $661,000, which you ask for this year, about 00 will be used for administration, and out of the $386,000 about 00 will be used for administration?

r. SMITH. Yes, sir.

r. McLAUGHLIN. Now, on page 171 of the Book of Estimates, 25, we find that the last paragraph provides as follows:

at of this amount $16,280 may be used for general administrative expenses ected with the lines of work of the States Relations Service, including the s of the director, the chief clerk.

nd so on.

ast year it was $20,100. I understand that portion of the money ied by item 25 is used for administrative work in connection i administrative work in farm demonstration and farm manage- it, under these special appropriations that I have referred to, and Lever Act. Am I right about that?

r. SMITH. Yes, sir; I think you are right. I do not know that covers the whole of it at all.

r. McLAUGHLIN. Is any part of any other appropriation used administrative purposes in connection with that work?

r. SMITH. A part of the $386,000.

r. McLAUGHLIN. I have mentioned that.

r. SMITH. No other appropriation that I know of.

he CHAIRMAN. Dr. True, would it be possible to bring all of these s of administration for the farmers' demonstration work in the th, East, West, and South together in one fund, instead of having administrative funds separated as you have them here—for in- ce, $16,000 and some odd for administrative expenses in con- ion with the extension act, then an unshown amount for adminis- ve purposes in item 26, and likewise an unshown sum for admin- itive expenses in 27? Could all that be brought together and ut in one item, so that it would show what your administrative nses actually were for these similar lines of work? Do you h what I am referring to?

r. TRUE. It would be possible to put into one item an adminis- ve sum which would cover in a general way the administrative nses, but that would be out of line, certainly, with the general e-up of the Agricultural appropriation act.

he CHAIRMAN. I was just wondering whether it would be desir- to aggregate these items of administration or combine them; or, at would not be desirable, whether it would be desirable, in your ment, with respect to items 26 and 27, for instance, to put into bill a limitation providing that only so much of this sum may be for administrative purposes. Would that hamper your work in way? I would like to get your judgment upon it.

r. TRUE. That would depend upon what is really meant by "ad- strative expenses." That is our greatest difficulty.

he CHAIRMAN. As I understand it, your administrative expense onnection with these two items means about this: Supervision; eling expenses in connection with men who are stationed in Wash- on and who must go to the field occasionally; and advice from e men, in a manner research work, in connection with the best

[illegible] matter of that sort. Beyond that there is no teaching work there, to amount to anything.

Mr. [illegible], a considerable number of these field men [illegible] administrative subject but give instruction as well [illegible] within the State.

The CHAIRMAN. I appreciate the difficulty of segregating these items, or the reason that, for instance, Mr. Smith, the head [illegible] is not on the same administrative officer but becomes a field agent as well, and I would be interested to know to what extent he puts in his office here at Washington and how much he spends in the field. I can understand the difficulty about that, but I think it ought to be possible to make that kind of a division without much guessing as to what is going to be done.

Mr. [illegible], the suggestion, as you say, is [illegible] Congress is [illegible] information regarding these matters as they go [illegible]

The CHAIRMAN. The question is [illegible] suggestion of the gentleman from [illegible] of the suggestion [illegible] of the [illegible] to the field work [illegible] the [illegible] of the [illegible] and [illegible] the [illegible] of the [illegible] the [illegible] of the [illegible] the [illegible] of the

officers who are capable of administering the fund wisely and economically. You have got to have that; but the point is that if it were segregated as much as possible it would make it more easily understood.

Mr. HELGESEN. I understood Mr. Smith to say that he had the amount of money that was spent in each State in the field. Why not insert that in the record?

The CHAIRMAN. Have you that?

Mr. SMITH. We can give you that.

Dr. TRUE. We can give the committee all the details of our expenditures as regards both of men and expenses that they desire to have.

Mr. MCLAUGHLIN. Dr. True, you are asking where we obtained the figures that we mentioned as indicating the expense of administration. We find it in House Document No. 112, Sixty-fourth Congress, first session, page 25, under the head of "Farmers' cooperative demonstration in the North and West," [Reading:]

Supervision: General direction of the demonstration work in the Northern and Western States and office routine, $72,114.74.

And under the heading "Farmers' cooperative demonstrations in the South" appears the statement [reading]:

Supervision: General direction of demonstration work in the South, outlining plans for cooperators and agents in the field and clerical routine, $90,772.07.

And in addition, of course, is that item of $20,100 carried last year in paragraph 25, page 171, of the Book of Estimates, this year $16,280.

Dr. TRUE. I understand now the source of the figures, but the committee will bear in mind that this document referred to is a report for the fiscal year 1915. That was before the organization of the States Relations Service, when all this work was otherwise arranged for in the department.

Mr. MCLAUGHLIN. What does that mean—that the expense of administration was larger then than now or larger now than formerly?

Dr. TRUE. It means that in the program for 1916 we have estimated to make a more exact showing of the relations of the different branches of our service.

Mr. MCLAUGHLIN. If these items I have read and these amounts I have stated do not apply to the work as it is now carried on, and if they are not your latest figures, can you give us the latest figures?

Dr. TRUE. The latest printed information is in the Program of Work, which we have been specially considering in this hearing.

Mr. ANDERSON. There is not very much difference.

The CHAIRMAN. The last figures, as I understand it, in reference to item 26 are the the figures submitted by Mr. Smith this morning?

Mr. SMITH. And those are included in the Program of Work.

The CHAIRMAN. The figures in your statement show the proposed overhead expenses for item 26 to be $54,793.75; is that correct?

Mr. SMITH. That figure covers salaries and expenses of my field agents—for farm-management demonstration, county-agent work, and boys' and girls' club work.

The CHAIRMAN. What other figures are there for administrative work?

Mr. SMITH. The item under the heading "administration."

Mr. ANDERSON. $24,824?

Mr. SMITH. A lump sum of $24,204 and statutory salaries amounting to $620.

The CHAIRMAN. Let us see if we understand that. For your administrative expenses in Washington under item 26 you have $24,824?

Mr. SMITH. Yes, sir.

The CHAIRMAN. For administrative expenses in the field?

Mr. SMITH. Partly in the field and partly in Washington.

The CHAIRMAN. In the field and partly in Washington you have $27,177?

Mr. SMITH. Yes, sir.

The CHAIRMAN. And the grand total for administration would be the sum of these two items?

Mr. SMITH. Yes, sir.

Mr. ANDERSON. $51,977.

The CHAIRMAN. So that it would, as a matter of fact, be an increase of $1,500 over the $50,477 for administrative expenses under the arrangement for the fiscal year 1914?

Mr. TRUE. That is not a very misleading statement of the situation, because, in my view of the matter, these expenditures which total $51,000 are not all of them strictly expenses in the strict and technical sense of that term. You can call them so if you desire.

Mr. MCLAUGHLIN. What work is covered by and paid for out of the $51,000?

Dr. TRUE. The work that is done under these items is the work of our field forces, who go out into the States to aid in the building up of this extension system and give instruction. That is, the $27,240 estimated for the instruction and extension work in the North and West and the $24,000 for similar work in the South will be spent next year in the field with about $50,000 which the State colleges and counties will have for this work. The money we use for the field service of our Washington force in aiding the States' forces is a contribution to make the extension enterprises in 48 States more useful to the farmers. Our men do not merely see that the Federal funds spent through the colleges are used within the terms of the law. Their chief business is to contribute by advice, information, and instruction to the planning and conduct of all the extension work throughout the United States.

Mr. MCLAUGHLIN. You mean your Washington force that goes into the field?

Dr. TRUE. Yes, sir; it is the Washington force, but they go out into the field not simply to administer, in the technical sense of the term, but to give instruction and aid to the forces in the States.

Mr. MCLAUGHLIN. I know how some of that work is done. It is very good work, indeed, too.

Mr. HELGESEN. Would it be possible to determine how much of these items is spent in the field and how much for office work?

Mr. SMITH. It would be possible, but it would not be very accurate, for these reasons: The fieldwork is growing constantly. As the States get increased funds we have to do more and more fieldwork, and we have to enlarge our force to meet that in any adequate

. The States call on us for assistance in that work. When we
it to assist Indiana in the organization of its county work they
to know "How is the plan in New York getting along? Can
go out and show us how they organize a county?" or "How is
work in California getting along? I understand they have a
that is different from ours." And our overhead force is sup-
d to be prepared to bring them that help.
r. HELGESEN. So, as the work increases, you have to increase
force?
r. SMITH. Yes, sir.
r. HELGESEN. But, would it not relatively be the same amount
t for work in the office and work in the field under a large force
nder a small one?
r. SMITH. Relatively, although right now I presume the propor-
is much larger than it will be later, because this whole exten-
work is a new project, requiring much more attention now
it will in the future when it gets to running smoothly.
r. TRUE. From my point of view it is not fair to compare the
k as it was organized in 1915 with the work as it is organized
er the present arrangements, because now there is thrown upon
States Relations Service the burden of assisting in the development
he extension system throughout the country, and that involves
rge amount of work on the part of people whose headquarters
be in Washington but who spend their time chiefly in the field
iding the development of this movement in the States. I do not
k it is fair to call the duties of that force purely administrative,
use that gives a wrong impression. That gives the impression
we are spending a large sum of money in purely formal adminis-
ive business, whereas we are using every effort to conduct our
ness in an economical way and to bring to bear on the States the
the knowledge, which the department can give in the building up
is great extension system.
he CHAIRMAN. Very well, Dr. True, suppose we pass on, then.
r. HELGESEN. Just a minute, Mr. Chairman. These items 26
27 were carried in practically the same amounts before the in-
ation of this States Relations Service, were they not?
r. TRUE. Yes, sir; but they were carried in the Bureau of Plant
istry, and they were only in a limited way united with the forces
he agricultural colleges. After the passage of the Lever Act
the creation of the States Relations Service, all this money that is
propriated directly to the department is spent in close cooperation
the agricultural colleges and in connection with this general
em of extension work which we are trying to build up in this
try. Now, there has never been undertaken so vast and so com-
ated a task of this character. I think the committee appreciates
, and I do not believe that when they look into the matter fully
will take the position that the department at Washington shall
have a competent and adequate force to aid the States in mak-
that system of the greatest advantage to our farming people.
r. HELGESEN. Yesterday we had some discussion as to the way
cooperated with the States, and I believe you said you cooperated
ugh the experiment station directors and the State and county
nizations, did you not?

[illegible]

[illegible]

[illegible]

ITH. Organizing the farmers.
UGEN. For political purposes?
ITH. To study their own business. Just the association of f farmers together in a farmers' club to talk about their ess, to get together socially, is well worth while; and those s grouped together may be federated into a larger club, nay constitute the county organization; or it may be that ization is projected along other lines and the county agent local people to form a purchasing association or marketing n, whatever it may be.
UGEN. You are aware of the fact that this appropriation is rally referred to as "political graft," as is the rivers and ppropriations as "congressional graft." It is alleged that nment is employing people and sending them out to further sts of politicians rather than the best interests of the It might be well to clear that up.
ITH. There is not, I believe, a man connected with this t who is there because of his ability and actual helpfulness mers in their business.
UGEN. However, you would not state positively that poli- ot enter into the selection of these men?
ITH. Yes; I would almost state it positively.
UGEN. "Almost"?
ITH. Because the farmers themselves have to be satisfied selection. Then, the State college must be satisfied that s competent for the job, and then the Department of Agri- elf must be satisfied that he is competent and that he can represent the Department of Agriculture. Those three erate in the agent's selection.
GEN. Your State agents may have ambitions, as I happen f some of them having ambitions, and it has proved very to them. Whatever influence he has radiates throughout Can you state positively that politics is not concerned in on of men for this service?
TH. I can state positively that, to my knowledge, it is not the Northern and Western States.
UGEN. Is it not a fact that those people lecture from the nd boost candidates for office?
LAUGHLIN. Is Prof. Holden in any way connected with ce?
TH. He is not and never has been.
UGEN. Mr. Holden was the prime mover in this line of was the originator?
TH. No, sir; he was not the originator.
GEN. I was not referring to Mr. Holden. I have no quar- Ir. Holden.
ELE. He is employed by the International Harvester Co.?
TH. Yes, sir; that is a private corporation.
ELE. When you get a county superintendent, what do you go out and get the farmers together and discuss the best crop-producing machinery and silos. What do you do silos? How do you discuss the silo question with the

Mr. SMITH. We will say that the county agent has looked over the county and studied the dairy interests and believes that the dairy interests would be benefited by having more silos. He determines upon the advisability of a silo from his knowledge of the subject and his study of local conditions.

Mr. HAUGEN. Let us carry on this silo question.

Mr. SMITH. Then that county agent will begin to agitate the matter of silos. He will probably first use the press. Then he will use what silos there are in the county as demonstration material. Usually there is in the community a wooden silo, a cement silo, or a brick silo; and he will have meetings to show those silos. Then he will interest some man in the putting up of a silo, and he will go there and he or that man lay out the form, mix up the cement, and show them about it—make a demonstration there as to just how to build a silo—and get estimates as to how much it cost, etc.

Mr. STEELE. Do you take into consideration the depth of water in the location in the county? Do you discuss pit silos with him?

Mr. SMITH. Yes; if it is in a country where pit silos are desirable. That has been a very important feature of the county agent's work in Colorado and a number of the Western States.

Mr. STEELE. Do you discuss that in Iowa?

Mr. SMITH. No, sir; not to the extent at all that we would in the Western States, because the silos in Iowa are mostly built above ground. It is only in those Western States where lumber is expensive and where the silo will dry out quickly.

Mr. STEELE. Is it not a matter of fact that in Woodbury County, where you have a county agent, there are many pit silos?

Mr. SMITH. If there are, that county agent would know it, and if it is a good thing that county agent will push the pit silo there.

Mr. STEELE. Do you take an inventory of the empty silos that are all over the country in that county, and why?

Mr. SMITH. He may do that. That is up to him. He is there, and he is responsible for the execution of the work.

Mr. STEELE. That is the point. You encourage our farmers to build silos, and after we have put in a thousand dollars in a silo the next year it is empty. Can you tell us why?

Mr. SMITH. Yes. That was the day when we had specialists going out who knew silos and dairying and did not take into consideration the whole farm operation. There are a great many sections in this country to-day where the silos are standing empty, because some specialist who was enthusiastic over a subject went out and urged the farmers to put in silos when that was not the place for silos.

Mr. STEELE. That was done by the people in the cities, who educated them, as you say—the commercial clubs and all that sort of thing.

Mr. SMITH. Not only by them but our colleges have perhaps erred on that side. Our specialists have erred on that side.

Mr. STEELE. Is it not a matter of fact that the silo is not worth anything, except for dairying purposes?

Mr. SMITH. That is practically all it is put up for—dairying purposes.

Mr. HAUGEN. If they are good for dairying purposes, why are they not good for feeding purposes?

Mr. SMITH. They are in some cases.

LE. Is a silo practicable for a feeder to put up?
TH. You mean for beef cattle?
GEN. Beef cattle.
TH. That would depend on a lot of things. It is not so
at beef cattle have succulent feed as it is that cows should
lent feed for the production of milk. Whether it is
for a beef-cattle feeder to put up a silo under certain
I would not undertake to say.
TH. He may be the one. The kind of county agents we
g in the Northern States is the kind that will inform
on that subject and preach the truth, and we want an
force large enough so that it can follow up that county
rk and find out whether he is doing good work.
GEN. Here is the point: You have got me to build a silo.
TH. If I am county agent, I have not got you to build a
you need it.
GEN. You have encouraged it by this new method of
nd you have got me now in debt, and this year I have not
ilo, for instance, and I wonder why I have not filled it.
many things to take into consideration when you go out
man how to farm scientifically. He has got to have a lot
and he has got to put up all of these improvements that
st in order to raise corn and these particular crops. So
age us to do many things that we can not do practically.
t get men to fill this silo. We can not get our neighbors
er and do it and, consequently, the expense is too great
we do not do it.
TH. Before I get through with this I will show you that
y practical and that we do not get you to build anything
to undertake any piece of work that is not going to prove

GESEN. Let me interject a word here. You are talking
g "practical." I visited an experiment station in our
e they have a quarter section of land. I noticed they had
uildings of all kinds, and I asked the superintendent how
ey they had invested in buildings. He said, "We have
uildings on a quarter section of land." I said, "Now, for
ort and convenience that is a good thing; but have you
ea that any farmer on earth who had to make his living
could take a quarter section of land and put $9,600 worth
gs on it? You have buildings here that even you do not
at is not practical.
AUGHLIN. You have answered the question. You said he
ngs he did not need.
GESEN. He said they are practical. I say some of these
e not practical.
AIRMAN. That is not your line?
TH. That is not my line. That is an experiment-station
have got away from the model-farm idea.
AIRMAN. Go ahead, Mr. Smith.
GEN. Before we get away from the silos I would like to
atter cleared up. If the rest of the members of the com-
through, I would like to ask a few questions. In view of

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[illegible] which are now empt
[illegible] overtime in su
[illegible] number of thes
[illegible] silos are them
Mr. S[illegible] that far; no.
Mr. [illegible] investigated th
[illegible] starting emp
[illegible] dollars in
Mr. [illegible] Any [illegible] of ther
Mr. [illegible] certainly are.
Mr. [illegible] Will [illegible]
Mr. S[illegible] that are empty a
[illegible] as whe
[illegible] has n
[illegible] and
[illegible]
Mr. [illegible] [illegible] from
[illegible] We have th
[illegible] has a
[illegible]
[illegible]
Mr. S[illegible]
Mr. [illegible] [illegible]
Mr. S[illegible]
Mr. [illegible] And that has been the exp
Mr. S[illegible] [illegible] has said. W
[illegible]
Mr. [illegible] And you are suggesting
the States [illegible]
Mr. S[illegible] We are suggesting the
of the Western States.
Mr. [illegible] [illegible]
class.
Mr. S[illegible]
Mr. [illegible]
Mr. S[illegible] We [illegible]
[illegible]
[illegible]
Mr. [illegible] Where?
Mr. S[illegible]
[illegible]
Mr. [illegible] [illegible] Minnesota
Mr. S[illegible] [illegible] M
[illegible] Nebraska, and [illegible]
[illegible]
Mr. REILLY. [illegible] States [illegible]
use through the summer.

Mr. SMITH. Yes, sir; that is particularly true near the larger es, where pasture is expensive and they want some green feed in summer time. There they may feed their dairy animals silage summer over.

Mr. HAUGEN. What about the expenses of the silo; what are your mates?

Mr. SMITH. I have no definite figures on that.

Mr. HAUGEN. You have no particular type to suggest?

Mr. SMITH. No, sir; the type is the kind suited to the community's ds.

Mr. HAUGEN. You are in charge?

Mr. SMITH. No, sir; I am not in charge of this particular thing. carry out to the States what the subject-matter departments nd for, and they recommend that kind of a silo in a community t would best fit that community as regards the price of lumber, regards the price of cement, and as regards the items of expense t go into it, and put up a silo that will meet the conditions most nomically.

Mr. HAUGEN. As to what machinery, cutters, and engines?

Mr. SMITH. They leave that to the man who wants to buy it.

Mr. HAUGEN. Why is it not better to leave the whole matter to the ple to decide for themselves?

Mr. SMITH. We do.

Mr. HAUGEN. If you will take a ride with me for 10 miles from home, I can show you at least five or six empty silos in Iowa and nnesota.

Mr. BENSON. Mr. Smith, may I refer to a little investigation in wa last week? I had been attending a conference at the Iowa ate College on the silo work, and there were seven people who re- rted that they had silos on their farms that they were not using. x out of the seven gave as the reason that they had changed from dairy farm to a hog farm; that they had gone out of the dairy siness. The seventh man stated that he had been induced to build silo by an agent who was selling silos, and he was not ready for it. I was wondering if that, in a measure, does not answer that ques- n. That happened to be up in your section, Mr. Haugen. A few them were in the northwestern part of the State and two of them re in Cerro Gordo County.

The CHAIRMAN. Somebody must have been selling gold bricks up re.

Mr. HAUGEN. And they are able to sell gold bricks upon the advice ng given by the Federal or State Government. We are in a bad siness.

Mr. OVERMYER. The silo agent was not an employee of the Govern- nt?

Mr. SMITH. No, sir.

Mr. HAUGEN. A large number of silos built in my section of the ntry were built at the suggestion of people in the employ of the deral Government or the State.

Mr. OVERMYER. The advisability of having silos was suggested?

Mr. HAUGEN. Oh, no; they go further than that. They give advice l instructions. They do not prepare specifications, but they give

[illegible] suggestions as to what [illegible] to required capacity of th[illegible]

Mr. KNAPP. I like to say, Mr. [illegible] I did not want the names of [illegible] tive of a silo company. I did not want to the security agents. It is our policy to [illegible] to the silo companies.

Mr. MCLAUGHLIN. In that connection, [illegible] to answer the part of the question of Mr. [illegible] security agents have in the [illegible] was stated that they had a financial [illegible] of silos.

Mr. SMITH. Commissions, in other wo[illegible]

Mr. SMITH. We have absolutely none. [illegible] man is interested financially in the selling [illegible] virus or anyway connected in commer[illegible] reason for his separation from the servic[illegible]

Mr. MCLAUGHLIN. It is proper to ask [illegible] one time in vogue is still continued or not [illegible] ago farmers were encouraged to build sil[illegible] partment, with the approval of the ver[illegible] encouraged the building of silos, in some [illegible] and in some cases going so far as to give [illegible] loss resulting from the use of the silo on [illegible]

Mr. SMITH. I do not know about that.

Mr. HAUGEN. Is it not a fact that your [illegible] of a certain type of silo, and it might p[illegible] certain type of silo pays a larger commis[illegible] there might be a leaning toward that par[illegible]

Mr. SMITH. There is that possibility. [illegible] hear of it.

Mr. HAUGEN. Has that matter been in[illegible] that will be thoroughly investigated? W[illegible] special agents?

Dr. TRUE. Mr. Chairman——

Mr. HEFLIN. Before Mr. Haugen lea[illegible] other field, I think it is very proper to [illegible] question about bonds being given by the [illegible]

Mr. SMITH. Mr. McLaughlin stated th[illegible]

Mr. HEFLIN. Yes, sir.

Mr. SMITH. I have no knowledge of it

The CHAIRMAN. I would like to ask [illegible] about it?

Mr. KNAPP. This is the first time I ha[illegible]

Mr. MCLAUGHLIN. Is any part of it t[illegible]

Mr. KNAPP. I have never in my life h[illegible] willing to open the entire correspondenc[illegible] since 1906 and put every man we have on[illegible]

Mr. MCLAUGHLIN. I am glad to hear y[illegible]

Mr. HEFLIN. In your judgment, no suc[illegible]

Mr. KNAPP. It never happened. I woul[illegible]

The CHAIRMAN. You and your father [illegible] work since——

Mr. KNAPP. Since 1904.

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IRMAN. Mr. McLaughlin desires to make a statement.
LAUGHLIN. I am not particular, but there is still a wide of opinion as to the value of a silo. I talked some time eorge B. Wharton, of Michigan. Some of you gentlemen he is. He farmed 1,400 acres in Lenawee County, in the n part of Michigan—the very best agricultural county in —and some men who know, or ought to know, what they g about say it is in some respects just as good as, if not i, any other county in the United States. Wharton was years master of the State grange in Michigan, and many him as an authority on farming matters. He runs a dairy has no silos and refuses to build any. He says he can an who has a silo. He does not believe in winter dairying has lots of cows, feeds his cattle, and keeps lots of hogs ns. He has his farm divided into 160-acre parcels, as near and he does not think the silo is profitable for him and his rk at all. He does summer dairying, he says.
even among those recognized as authority there is still a ence of opinion as to the value of silos. I firmly believe ne quarters, however, it is very helpful indeed and neces- nan if he is going into the dairy business. Perhaps there onditions that might not appear on the surface that would dvisable for the farmer to have a silo.
. Does he run his dairy in the winter? Maybe he only mer dairy.
LAUGHLIN. Largely, of course, in the summer time, and he s the way to do it, because he refuses to put a great lot of e ear in the silo. He uses it for feeding the hogs and, I lls some of it.
TH. Recognizing that many silos are standing idle, we ractically all of our meetings called the attention of the ents to that fact and cautioned them against overenthu- ie building of silos.
GEN. And they are still talking silos?
TH. It takes quite a while to get it out of their systems

GEN. Just one more question, and I think I will be satis- t not a fact that the agents of the silo companies lecture ame platform that your men do?
TH. They may do that.
GEN. Is it not quite general?
TH. No: it is not quite general.
GEN. Do you think that is proper?
TH. They may do that in a few States or a few localities, t quite general.
GEN. Do you believe it is fair to advertise great meetings ense of the Government and invite these people or permit onto the platform and thus advertise their wares?
TH. No.
AIRMAN. Do you advertise these meetings in the real sense d "advertise"?
TH. The question was whether——
GEN. I take it all meetings are advertised, one way or an- ot there would be no audience at the meetings.

The CHAIRMAN. Paid advertisements?

Mr. HAUGEN. I do not mean paid advertis

Mr. HENDERSON. I do not know anything I would like a little information. Living. part of this country, where the seasons ar fodder can be raised very easily, but where to produce, and where the winters are long very long, do you not think that where we profitable thing to have silos?

Mr. SMITH. I would not dare venture an ion here. I would want to see what some as to whether it was worth while. If I fo I would spread that information.

Mr. HENDERSON. That is not enough. You expect. You say there are conditions und profitable. What are those conditions?

Mr. SMITH. Dairy conditions; a good c the chief things.

Mr. HENDERSON. I should beg to differ wi A good corn country can get along withou you have a condition in which you could r otherwise lie fallow and get a good crop not otherwise have use for, it seems to me place for silos, if I know anything about it.

The CHAIRMAN. The answer is you woul

Mr. SMITH. I would not pose as an expe pert; I would ask the dairy division.

The CHAIRMAN. I think right in that co say what some of us know that you get of these suggestions from the various bur who furnish the scientific facts to you.

Mr. SMITH. Absolutely. The subject m people distributed over the States is derived divisions; that is, the research divisions of partment. We are the carriers of that info link between the people and the research m excepting as carrying experts in organizatio

Mr. HENDERSON. Will you then get permiss tion of mine and insert the answer in the rec

Mr. SMITH. I think we can.

Mr. BURTON. I would like to ask about mi of years ago a statement came out from the and was published in the papers, to the ef was going to be sent out of Chicago becau milk. What effect does it have except on th

Mr. SMITH. I could not answer that. the Dairy Division. They have made a spe

The CHAIRMAN. I would say that Mr. I committee in the next few days. He is Division.

Mr. SMITH. Why do we have so many special questions?

The CHAIRMAN. That would be a questi Agriculture to answer, and he will be with

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got to make progress on these matters. This is the longest
ng we have ever had. I am not impatient, but we could talk
ıy on one side or the other if we all talked.
. HAUGEN. Let us clear up the silo question. The question of
was not raised, but the method pursued by the department to
tise or encourage the building of silos when so many silos
mpty.
. SMITH. And we hope through the county-agent system to
the building of silos only where silos are needed.
r. HAUGEN. If they are needed, I think the farmers are probably
r judges than experts to decide what silos are best and what to
ı that matter.
r. REILLY. We do not need agents in the State of Wisconsin;
farmer there designs his own silo.
r. HAUGEN. The agents are out there teaching.
r. REILLY. They are doing that in Iowa, not in Wisconsin.
he CHAIRMAN. Go ahead, Mr. Smith.
r. SMITH. During the year the county agents have carried on
onstrations themselves out in the field and have also utilized the
onstrations that were already there, made by the farmers them-
s.
might, perhaps, explain to you just what I mean by that. Take
agent out in Utah, for instance. When he went down into
ard County he found that the farmers had difficulty in growing
l crops, particularly wheat. Some of the land was wet, and the
land did not produce wheat very well. So the county agent
d around over the county to see what the farmers were doing,
found five farmers who were growing wheat very successfully.
ooked into their methods of growing and the kinds they grew.
found the successful farmers were growing Turkey Red wheat
that it came through the winter, whereas most people grew
ıg wheat, which rusted badly and ripened a month later. As a
t of learning how those people handled that wheat crop he got
armers to put in 10,000 acres of Turkey Red wheat that fall.
next year 30,000 acres of Turkey Red wheat was put in. The
t found there a few farmers doing that thing; he spread the
, and that was a demonstration on his part just as much as
gh he himself had brought in the wheat and got some farmer to
; it under his direction.
ıe more instance, from New York. Mr. Robertson, our agent in
rson County, found one farmer growing winter vetch. This is
pecially good crop on poor lands. Vetch is a legume. He not
got that man to talk vetch growing all over the county but the
ledge of how to grow that crop, and the planting of the crop
pread over that county and adjoining communities as a result
s efforts.
ıave before me tabulations of the county-agent work, covering
done in relation to the people, work done in relation to the
and farmstead, work done in relation to crops, work done in
ion to live stock, work done in relation to fertilizers and fer-
, and work done in relation to farm business. If the committee
to have them incorporated in the report, I will present them.
ıe CHAIRMAN. I think they may be incorporated in the hearing.

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...ement embodying a few important items from the annual report on county-agent work in the Northern and Western States, etc.—Continued.

	Agents reporting.	Number.
WORK DONE IN RELATION TO FARM BUSINESS.		
...ners induced by the agent to keep farm accounts, partial or complete	204	4,619
...mers' exchanges organized in 1915	70	93
...e of business done through such exchanges organized in 1915	51	341,110
...ns supplied with laborers through exchanges or otherwise	120	2,935
...l number of laborers furnished to farmers	122	5,488
...er purchasing and marketing associations organized	69	164
...l value of all business done in 1915 by all associations organized by agent or ... his suggestion	113	$3,575,373
...roximate savings affected by such associations	100	$277,975

Mr. SMITH. I want to call your attention to this chart, which ...ows that on the north and west practically every community has ...rked out good systems of farming that are paying. About 20 per ...t of the farmers in practically every community have good sys...ms of farming that are paying well, while perhaps 40 per cent ... the farmers may not be getting wages.

This reference is made to farm-management demonstration work ...at I will take up immediately after the county-agent work, but I ...esent it to you here because it shows you the value of using demon...rations that are already in existence in the county. This chart ...presents demonstrations made with groups of farmers in 64 coun...s and in 19 States. The demonstrations were made where these ...ack spots show on the map [indicating on map].

In this kind of demonstration work we go into a community and ...alyze the business of about 70 farmers in that community, and ...d out how much they are getting for the use of their capital and ...eir labor and what factors are contributing toward their success.

If you look down this column here [indicating on chart], you will ...tice that I have given not the names of the States but the number ... the State, and this shows the number of demonstrations we have ...ade in each one of those States. Column 2 shows the number of ...rms which have been analyzed.

Mr. HELGESEN. In that first column you have a hyphen or dash ...tween them. What does that mean?

Mr. SMITH. The first figure is the number of the State; the second ...dicates two demonstrations each of about 70 farmers. That gives ... total number of farmers there.

In this column here [indicating] we have the average labor income ... the farmers in those 64 areas—the average of each group. You ...ll see that the average of all that group is about $387; that is, ...ter allowing the farmer 5 per cent interest on his investment and ...at the farm contributes toward the support of the family in the ...y of a living, this is what the farmer has for his wages as manager ...d as actual laborer for the year.

Mr. HELGESEN. You say "what the farm contributes." You do ...t mean simply the vegetables and things. You mean the living?

Mr. SMITH. The vegetables and meat and the house, shelter—those ...ings.

Mr. HARRISON. But not what he purcha

Mr. SMITH. It does not mean sugar a
something extra; only what the farm cont

Now, that the best four-fifths of the f
are set out in this column [indicating], a
of all those farmers making up that gr
cent of their investment and what the fa
[laughter].

The CHAIRMAN. Those are your 20 per

Mr. SMITH. Those are the best fifth
the first end of the line, the poor

Mr. HARRISON. Was it all for the same ye
these farms?

Mr. SMITH. Whether they were taken
same size farms, as I will show you later
farms. We are using the information for
I want to go back to the community and sh
there. Right here, gentlemen, are men
and I want to show the per cent group of fa
working the whole year and getting on
group who are working a year and going
show you what per cent interest on investm
poor fifth of the farmers in this com
is going on, and I want to take them over
show them what it is.

We have made 141 of those demonstra
and in every community so far as I have
have an expectation that one-fifth of th
year make $1,000 a year more than the
only $8,000 more a year than the poorest

Mr. HARRISON. Is that poor fifth column
What does that mean?

Mr. SMITH. That means a loss. That
would have had got a dollar for it, and
it's interest money I mean. He has ha
a part of it, but has not had up anything
that he is having his farm on the ma
pay the interest he never in this world
farmers that kind of farming.

Mr. HARRISON. It means more than th
bankrupt in pretty soon, does it not?

Mr. SMITH. It does, but bankruptcy d
may be 10 or 20 or 30 years before it
gets his living each year in large measur
worth $8,000. That is only $817 good
foreclose on him that you'd be runs o
before foreclosure.

The CHAIRMAN. Right at that corner
a grist. I think I was reading a very
statement issued by some official here o
member who. I may have been some off
as to the wonderful prosperity of the
this past year produced something like ni
$ of farm products, and so on. The

rt shows that the individual farmer, after all, is not nearly
d a condition as the figures as to the aggregate farm wealth
id one to think. Is that right?
ITH. Probably 40 per cent of them, if you allow them in-
their investment and what the farm furnishes toward their
e making less than a dollar a day for wages.
HAIRMAN. That is an exceedingly important chart, and if it
much trouble I want it to go into the record.
hart referred to follows:)

agement demonstrations—Labor income of 64 groups of farmers in 19 States.

and number of oups.[1]	Number of farms.[2]	Average labor income.	Best fifth.	Second fifth.	Third fifth.	Fourth fifth.	Poorest fifth.
.....	138	$391	$1,766	$552	$291	$4	— $834
.....	65	1,117	3,329	1,953	1,202	775	— 173
.....	67	— 94	1,041	220	— 40	−318	−1,112
.....	304	200	1,002	430	174	— 25	— 470
.....	202	293	1,333	560	279	— 51	— 805
.....	573	215	998	349	164	— 19	— 418
.....	252	282	965	418	220	76	— 224
.....	199	327	1,536	568	164	−160	— 471
.....	465	276	955	450	234	61	— 261
.....	351	335	1,237	698	380	71	— 551
.....	112	— 24	583	217	68	−177	— 894
.....	90	445	2,382	1,003	518	— 63	−1,386
.....	318	273	1,189	660	292	— 91	— 792
.....	170	369	1,152	444	220	41	— 297
.....	424	313	991	502	278	57	— 294
.....	247	373	1,266	684	359	90	— 418
.....	133	346	1,216	537	297	110	— 3[illegible]5
.....	178	416	1,750	525	298	140	— [illegible]42
.....	79	323	930	544	336	100	— 347
.....	4,400	387	1,421	642	331	49	— 517

ure is the State number; the figure following the dash shows the number of groups of farms in the State.
3 farms in a group.

AUGEN. That chart gives no information unless comparison
e in the same area, the size, and the productiveness of the
ou may have here a productive farm and one across the
productive. There are many farms that can not be farmed
t and others that can be farmed at a splendid profit.
LAUGHLIN. It certainly enables an agent to learn where and
means profitable farming has been carried on and to take
s to others who have not been able to do their work right.
AUGEN. Certainly a farmer would never reach the conclusion
itable farming could be done on alkali land with alkali
ertainly it would not be necessary to carry on an experi-
determine that.
IAIRMAN. I would ask you to give the history of that chart.
ITH. I introduced this chart for one purpose—to show you
ir demonstration work we find good farmers in every com-
ho will serve as illustrative material and who will serve as
ation material. I stated to you that the county agent does
gs: He carries on demonstration work himself; he goes out
the farmer to put in an acre or two of alfalfa, and he may
to sow the seed and to inoculate it. In addition to that, he
e demonstrations already there, and a large phase of his

AIRMAN. Then, in your next column you found that 20 these 138 farmers secured a revenue of $1,766?
TH. Yes, sir; that is exactly it.
ELE. In finding that, did you take into consideration the vidently he was a trader—that he outtraded these other little? You took into consideration the amount of the ught and the products that he brought onto his farm?
TH. That entered into it. I may say that in this demonwork we attempt to take a group of 70 farmers where are fairly similar. We do not want to compare a lot of things.
LY. You eliminate the speculative buying farmer?
TH. If we find any abnormality, we eliminate it.
GEN. Buying and feeding stock?
TH. We take that into consideration, but that is not the the large majority of farmers.
AIRMAN. Doctor, please go on.
GEN. How does the soil compare giving $1,766 profit and h the smallest profit?
TH. They were all taken in the same area. I will show the factors that enter into those items—the size of the e equality of the business, the increased yields, and pro- stock. The diversity of the business and the efficiency he handles men and tools and all those things are taken eration in making this demonstration, as I will show you chart. I do not want to go to the next chart yet, as I inis chart for one purpose only, to show you that a certain good farming is being conducted in practically every ocality, and that such farms may serve as demonstration

AIRMAN. Please go across those under 20 per cent.
TH. Yes, sir.
AIRMAN. The next 20 per cent of these make $552; your $291; your fourth fifth makes $4 a year?
TH. Yes, sir.
AIRMAN. And your poorest fifth loses $834 a year?
TH. Yes, sir.
AIRMAN. And these farms are all within the same neigh-

TH. Yes, sir.
AIRMAN. The climatic conditions are practically the same?
TH. Yes, sir.
AIRMAN. And the soil conditions are practically the same?
TH. Yes, sir.
AUGHLIN. In each group?
TH. In each group.
AIRMAN. The labor conditions are practically the same in ?
TH. Yes, sir.
AIRMAN. All things that enter into the farm are practically except probably the ability of the farmer and the intelliscientific knowledge with which he controls the farm.

[illegible]

Mr. HAUGEN. That is what year?

Mr. SMITH. That is the past calendar year.

Mr. HAUGEN. What States were reporting?

Mr. SMITH. I am not trying to cover all the county agents' w and of the county agents reporting to us.

Mr. HAUGEN. This takes in all of the United States?

Mr. SMITH. All of the Northern and Western States; no Southern States.

Mr. HAUGEN. You mean an increased yield from the pre year?

Mr. SMITH. This year the fields under the control of the a gave an increased yield, where the work was carried on in accor with the directions of the agents, of 8 bushels to the acre more the farmer got in growing his wheat in the ordinary way.

Mr. STEELE. Sixty-nine of the group that you have given?

Mr. SMITH. I have gone beyond that group.

Mr. STEELE. Sixty-nine were concerned in that group; and raised the average 8 bushels?

Mr. SMITH. I did not say that, sir. I said of the agents repo to us in the wheat belt of the Northern and Western States.

Mr. STEELE. Did they pick out some particularly poor fields of eat?

Mr. SMITH. They took a man's farm, and on part of the farm he ndled his wheat according to his usual method. On an adjoining d or area he handled it according to the agent's methods.

Mr. STEELE. What was the average per acre in the United States—

The CHAIRMAN. Let him answer.

Mr. SMITH. And when he compared the two the average for these nts was 8 bushels above the ordinary practices of the farm.

The CHAIRMAN. On the same farm?

Mr. SMITH. On the same farm and the same field.

Mr. HAUGEN. What did your agents suggest doing? What ex- se did it involve to the farmer? How much profit was there in 8-bushel increase?

Mr. SMITH. I can answer that only in general terms. Usually includes, in the case of corn, carefully selected—fall selected . It includes sowing a variety that is adapted to that community. ncludes the best cultural practices that the community knows. agent does not usually bring into that community many new cul- l practices from the outside. It is the best usually that the ners there themselves know. He gets someone to put that best operation there.

Mr. STEELE. Here is the point with me; I want to know this: I am sowing 160 acres of spring wheat, and you want to dem- rate. What particular seed shall I use? You take 40 acres I sow it all at the same time.

Mr. SMITH. I will tell you what the agent, J. P. Welch, did in lard County, Utah. The farmers usually sowed spring wheat. agent said to them, "I would like to have you try this year e of this Turkey Red wheat and sow it in the fall." The farmers and planted spring wheat alongside. The Turkey Red wheat n in the field gave a yield of 30 to 60 bushels to the acre on 00 acres in Millard County that year, whereas the spring wheat around 12 to 15 bushels to the acre.

Mr. STEELE. That is true with me. I sow fall wheat. One year t 46 bushels to the acre; the next year about 13, sowing the same at and on the same piece of land, or adjoining land; and my ng wheat went down with the rust; I did not get anything.

The CHAIRMAN. That is not a parallel case. This is the same year on the same field.

Mr. HELGESEN. I am thinking there may be a wrong impression n here. I do not suppose you would contend that, if the advice n by your agents to the farmers that you so increased their yield ishels to the acre was followed by all of the farmers, it would e the total?

Mr. SMITH. No, sir.

Mr. HELGESEN. Do you know what the average is for the United es?

Mr. SMITH. It is usually about 13 or 14 bushels. I do not know much it is this year.

Mr. HELGESEN. If you increased that eight bushels you would in- se it 60 per cent in one year.

Mr. SMITH. We can not do that and do not want to.

Mr. HELGESEN. I know you can not.

Mr. STEVENS. Here is the point I want to
Mr. SMITH. I am giving you this data
of the agent and the fact that many far
—ds.
Mr. HAYDEN. Here is the official rel
Mr. SMITH. I am giving that at this
What the cost of it is to us. We
States that this is the interest
the North that is the case. The
as to the cost of the
We are
Mr. STEVENS. What is the state the in
the purpose of the
Mr. HAYDEN. At that
Mr. RAINEY. What sort of a season wa
Mr. HAYDEN. The season was very bad
Mr. RAINEY. That was not the fault of
Mr. SMITH. Mr. Chairman, we are try
Mr. HAYDEN. What I would suggest
a specialist. For instance, farmers la-
country who sold their farms to oat-
planted to cotton or to hay.

I have a farm in 1914 I made money o
short. It was farmed by the same men a
year before. The season and the crops
If so, these comparative figures, and tab
give the information that we ought to ha
to the country.

Mr. SMITH. We recognize, Mr. Chairm
of the elements of farming, and we are t
we call "farm-management demonstrati

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ıe purpose of which is to increase the net income of the
ı.
GEN. Regardless of cost?
TH. Net income.
LY. That covers Mr. Haugen's proposition as to cost.
GEN. You are not prepared to give the net income?
TH. Yes; we are.
GEN. You have increased bushels, but have got increased
increased cost.
TH. I will take up the whole farm proposition and show
e are trying to carry the demonstration work on with the
ı—what we call our "farm-management demonstrations."
IRMAN. All right, Doctor; go ahead and do that now.
llowing chart was used by Mr. Smith to illustrate his
)

*ıg method of comparing the business of an individual farmer with
: average and the best farmers of the same community, as regards
ne and the factors that enter into farm-management demonstrations.*

Items.	Baldwin farm.	Average, 193 farms.	Average, 25 best farms.
	—$45	$190	$750
	$4,745	$4,642	$5,923
	51	68	93
horses	2	2	3
	11	6	8
ops and stock)	$715	$763	$1,498
)ps	$12	$255	$614
	.2	2.3	3.4
ushels)	100	90	109
	10	10.7	13.3
e (bushels)	18	19	24
	7	9	11
e (bushels)	15	15	18
	27	35.1	49.3
e (tons)	.9	.6	.66
(milk and butter)	$30	$44	$62

ns analyzed in an area is visited annually thereafter for a number of years to make similar
ljustments in the farm business in order that they may become actual demonstrations of
f increasing the money which a farmer secures from his business by properly organizing it.

TH. We go into a community and analyze the business of
armers—sometimes more—and I have done that in this
vant to show you how we carry on this demonstration
our information. Let us consider first this column [indi-
That is a community in southern New York of 193 farm-
verage income of those farmers—the average labor income
got for their wages after allowing 5 per cent interest on
and what the farm furnished toward the family living)
In that same community there were 25 of this same
best in it—who were making an average of $750 a year;
re the factors which go to bring in that income of $190
] and that income of $750 [indicating].
ors shown in these two columns [pointing] show why some
e getting $750 a year and why the average are getting

addition to showing the average income of the community
erage of the best farmers, we go back to each individual
l sit down with him and go over his individual business
nd find out, if we can, why he is getting a labor income

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ckwheat—yield per acre, 15, 15, and 18 bushels, respectively. e is nothing striking about that.

en, acres of hay, and yield per acre in tons. Mr. Baldwin got n per acre, the average farmer 0.6, and the best farmers aver- only 0.66 tons per acre. You will notice that this man, Mr. win, is growing just as good crops as the average farmer in ommunity. He is growing a 50 per cent better hay crop than verage farmer in the community. Yet he is getting a labor in- of minus $45 a year.

t us look at the last figure. His receipts per cow are $30, the ge is $44, and the better farmers are getting $62 per cow.

you want to set that man fundamentally right in his farming, are you going to say to him? You want to increase his net ne. What are you going to tell that farmer if you are a county ? Sitting down beside him, you will probably tell him these s:

otice the average man in this community is farming 17 more than you with the same number of horses. Your horses must nding in the barn part of the time. The average farmer here is ing a little more land and making a little more money. Perhaps an rent 20 more acres of land. This will give more work for elf and horses, and enable you to make a little more money.

econd, you have 11 cows. The average on larger farms is only ile on the best-paying farms they are keeping but 8 cows. e your cows are returning but $30 each, while the average cow brings in $44, and on the best farms $62 each. I am inclined nk that you better keep a record of those cows, feed them right, et rid of your poor cows. You can double these yields, you can them, but as long as you feed them to $30 cows you will never a cent of money."

e important thing in demonstration work with this farmer is t him to improve his herd.

ird, you will notice the average farmer has $255 worth of cash to sell, and we would suggest to Mr. Baldwin that in his unity, where potatoes do so well and perhaps beans and some crops, like hay, he raise more cash crops, because that seems the way the more successful farmers are conducting their ess.

at is perhaps all we will tell Mr. Baldwin this year—just those e things: "Rent or buy a little more land. Be sure that you t that herd, weeding out the poor cows, because as long as you your crops to that group of cows it is practically impossible ou to make money. Grow a few more acres of crops to sell." ight not tell him another thing this year.

e next year, in these farm-management demonstrations, we will around and analyze that same man's farm again. The next year ay find it desirable to speed him up on his oats or buckwheat tato yields, whatever it is.

ler this demonstration work we plan to follow that man up for ps four or five years, setting him fundamentally right first, giving him information as he needs it on the speeding up of elds and the better handling of his crops and stock, and I me at the end of four or five years he will be a good deal better r than we are.

Mr HAUGEN. Do you contend that but
taxed into consideration in keeping cows?

Mr SMITH. No, sir.

Mr HAUGEN. You say, "Get rid of th
may be worth more than the $40 cow.

Mr SMITH. I said, first of all, keep a r
what they are bringing, because in that g
average is $80, some may be bringing hin
the $40 cows.

Mr HAUGEN. I understood you to say
represented the cream sold?

Mr SMITH. That represents the receipt
butter in the three groups compared.

Mr HAUGEN. The milk is worth more
localities.

Mr SMITH. Probably. This is a char
community.

Mr HAUGEN. The chart gives the resul

Mr SMITH. Yes. If it were out in Io
such a chart the principal things that go
and results in Iowa. We would include h
of the number of cattle fed, of the hogs
that chart to suit the conditions of a par
are found in that community.

(Here Mr. Smith referred to another ch

Farm management demonstrations. Effect of go
York farms.

| Num
ber
farms	cows
12	Two-thirds as good as average
12	As good as average
14	One and one-half times as good as average

Mr SMITH. Suppose the farmer raise
cows. "Does it pay to have better cows?"
further data. Here is that same commun
chart] are 12 farms where the cows were
average of the whole community. The lab
are 12 farms where the cows were equal t
come being $181. Here [indicating] are 1
one and one-half times as good as the ave
is $1,175.

(Another chart was referred to at this p

Farm management demonstrations. Effect of co
York farms.

| Num
ber of
farms	Yields
12	Two-thirds average
	Equal to average
	One and one-half times average

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MITH. See [indicating] the effect of good cows as compared
yields in that particular community. Here are 22 farms
e yields were two-thirds as good as the average. The labor
vas $364.
giving you this now to show you that yields is only one of
rtant phases in this demonstration work.
[indicating], 17 farms where the yields were equal to the
and the labor income $712.
xt [indicating], 24 farms where the yields were one and one-
s the average and the average income $653.
nay be misleading. We are inclined to think that on prob-
per cent of our farms increased yields are desirable. Just
h we are not able to say.
AUGEN. Are those net or gross increases?
MITH. That is the labor income after you have taken out all
and your interest.
following chart was also shown to the committee:)

agement demonstrations—The relation of receipts per cow to labor income—Demonstrations in the State of Washington.

Receipts per cow.	Number of farms.	Average labor income.	Number of incomes over $500.
.....	14	−$219	1
.....	11	22	3
.....	13	368	4
.....	13	565	6

MITH. This is another chart showing some demonstration
the State of Washington, representing a group of farmers in
ommunity. Here are the receipts per cow under $65. There
farms; the labor income on those farms, where they had that
cows, was minus $219. The number of men who made over
hat group was just one.
the cow receipts ran from $65 to $80 per head, there were 11
here the cows returned an income of $22. There were three
hat group who made over $500 each.
the cow receipts ran from $80 to $95, on 13 farms, the aver-
income was $368, and there were 4 men out of these 13 who
income of over $500 each—showing that with good cows
income quite uniformly increases.
the returns per cow were over $95, 13 farms had a labor
f $565.
AUGEN. What do you say the cost of keeping the cow is?
under $65, minus $219?
MITH. That is the returns.
AUGEN. But have you an estimate as to the average cost?
MITH. The Office of Farm Management has some rather ac-
ata on farms in Wisconsin and Michigan. I can not quote
ures accurately, but the cost of feed alone ran between $50
Then, there was a large overhead cost—depreciation, inter-
vestment, buildings, medical fees, etc.
AUGEN. Where there is only one in that class of $65 and the
ninus $219?

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Here are 11 farms where there were f
that the average, and the labor income
average for the group being $1,250.

Pretty nearly every farm is weak alo
and in that analysis that I showed yo
letect it.

llowing chart was also exhibited:)

ɔement demonstrations—Effect of size of business on labor income in one New York community.

Number of farms.	Days of work.	Labor income.
.....	278	$279
.....	406	574
.....	678	1,037

ITH. Before I go back to that original chart I desire to attention to this one. This is another way of measuring business. In that same community there were 23 farms, iness was so organized or their farm was big enough so rmer could do his work in about 278 days. Note the labor $279. There were 28 farms where the number of days ided by his system of farming was 406. He hired a little time during the year.

LAUGHLIN. That first line of 23 farms where the work days that means his line of business and his organization were ıe was idle practically 100 days in the year?

TH. Yes, sir.

JGEN. He might be doing something else.

TH. But nothing productive; that showed up in this figure. ıe important thing—to organize your work so you make y.

UGEN. A farmer might be carrying the mail part of the arming 50 acres. In other words, 278 days at $279 means llar a day. Another group of farmers working 406 days 574, which is about $1.25 a day; and a third group work- ys produced $1,037, or about $1.50 a day?

TH. That is it.

rk that I have been explaining is what we call our farm- nt demonstration work. It is supplemental to the county- x. We feel it is fundamental to county-agent work. We this work only in counties where they have a county agent ıe primary purpose of teaching the county agent how to ring the year 140 of those demonstrations were made in es with 140 county agents.

GEN. Will you go on and give us a comparison of soil, etc.?

ELE. That demonstration would show that the farmer was ery small price per day for his labor, would it not?

TH. This chart was intended to show you this one thing, size of the business increases the labor income increases.

JGEN. Is it not possible that the soil had something to do well as the labor?

TH. We have that. We have every bit of that on the each one of those farmers; that is all taken into account.

ELE. In all your demonstrations you have shown that the getting about $1.50 a day.

GEN. But you have not taken into consideration the differ- soil.

VELL. He says he took into account every feature.

Mr. SMITH. What is the measure of soil fertility? It is the crop yield. How do you measure soil fertility? By the crop yield; and I showed you the crop yield.

Mr. HAUGEN. I thought your contention was it was due to more intelligent farming?

Mr. MCLAUGHLIN. That would not be of any value at all if it were not actually representative.

Mr. SMITH. No, sir; it would not.

Mr. MCLAUGHLIN. The soil was practically the same and every facility available to one man was available to another, if he knew enough to take advantage of it.

Mr. STEELE. That demonstration that you have made, which shows the farmer getting small wages, would not that encourage him to quit the business and become a scientific man in the Department of Agriculture?

The CHAIRMAN. That is what he is doing now; he is leaving the country and going to town.

Mr. SMITH. We are trying to show him right there in that community that he can make more money than he can in the department. You remember 20 per cent in that group were making $1,500 for their wages, after getting their house rent and much of their living from the farm. That is more than any man in the department is making that I know of. [Laughter.]

Mr. HAUGEN. There is some difference in the investment.

Mr. SMITH. He gets interest on that.

Mr. REILLY. You ought to change it and bring those fellows into the department and send the others out to the farms.

Mr. SMITH. The differences in the soil on each man's farm are shown by the yields of his crops.

Mr. HAUGEN. I have understood you to contend that it was due to the intelligence of the farmer?

Mr. SMITH. No, sir; that net income is due to a number of things. Intelligence is one of them; good-sized business and good soil are others.

Mr. HAUGEN. It is labor intelligently applied that counts; that is what we have been taught; and now you give the credit to the soil.

Mr. SMITH. You draw too broad conclusions.

Mr. HAUGEN. As yet we have had no comparison of the soil, except in the same community; and you and I know that farms are not of the same value in the same community. A farm on one side of the road may be far superior to one across the road.

Mr. SMITH. There is the average from the whole community.

Mr. REILLY. Doctor, in making up that table, what account do you take of the farmer's family helping?

Mr. SMITH. That is taken into account and taken out.

Mr. REILLY. That is charged up?

Mr. SMITH. If the boy works, we charge that up.

Mr. HAUGEN. Take the average best earning of $750 and the other of $190, what goes to make up the difference? Is it the soil or the labor applied?

Mr. SMITH. That $750 group farmed more acres, had better yields, kept better cows, grew more cash crops, and handled labor more efficiently.

Mr. HAUGEN. How about the item capital invested?

Mr. SMITH. That item is made up of value of land and buildings nd working capital. All those are included in that item of capital nvested. That group has larger farms, and therefore more capital.

Mr. HAUGEN. You are contending that the profit on the 93-acre arm is $5,923. That is the average, as I understand it?

Mr. SMITH. That is the capital invested. The labor income is 750.

Mr. HAUGEN. Is it not possible that the farms included in the olumns giving larger returns had better soil than those in the ther?

Mr. SMITH. We take this dissatisfied farmer right over, if he is n doubt, to the other men's farm and let him see.

Mr. HAUGEN. That is what you do, but you are now showing re- ults. I fully agree with you that you are doing good work, but I m afraid these figures are misleading. My contention is that where ou show any increase of crop you should also give increase of cost, nd when you make a comparison of farms you should take into onsideration the variation of the soil as well as the labor.

Mr. SMITH. I want to get this clearly before you. These data pply only to this year and are for demonstration purposes only. his may have been a very dry year. The comparison, however, f this successful man [indicating] and this unsuccessful one is elpful in setting the latter right.

The CHAIRMAN. Doctor, is there anything further you want to ay?

Mr. SMITH. That covers the farm-management work pretty well, think. I will say we have carried this work on personally with 0,500 farmers during the year and a half this kind of demonstra- ion work has been in existence, and I want to explain to you here hat under this item of demonstration, which we discussed at the utset this morning, the men classified under administration in Wash- ngton go out and teach the field men how to do that kind of work. hey go out to a county agent and help that county agent take the ecords and show him how to put them into shape to get the matters f vital importance before the farmers. It is actual demonstration ork—much more than it is administration work. Yet they neces- arily have their headquarters here.

Mr. MCLAUGHLIN. Later, I suppose a bulletin will be published ontaining these tables and explaining your comments?

Mr. SMITH. In pretty nearly every one of these areas little pamph- ets have been gotten out to send back to the farmers, with the ex- lanations, and also including the analysis of his own farm in form or comparison. We explain the whole matter to him personally on is own farm and also go further—we induce him to keep a simple ecord of his business during the coming year. The important thing s that we show him how to interpret that record at the end of the ear and understand what it means.

The CHAIRMAN. Doctor, will you tell us a little something about our boys' and girls' club work, and then you will have finished your eneral statement?

Mr. SMITH. Yes, sir.

Mr. HELGESEN. Before you take up that, are you going to give a ap?

I am [illegible] submitted herewi

[redacted]

. SMITH. This map comes in connection with the farm-manage- demonstration work that I have just been mentioning. These -management demonstrations have been carried on wherever you ne of these black dots.
. LESHER. I see you have worked all around Pennsylvania. t is the result in Pennsylvania, for my own information?
. SMITH. We have carried this work on only in cooperation with tates as they care to take that particular kind of work up with We took up this work because we felt that in the North, with its sified agriculture, it was fundamental to a clear understanding e agriculture in each county by the county agent. We put only t $40,000 into that work last year, and we took it up with the s that were interested in taking up that work. Pennsylvania ot yet been in position to take up the work.
. HELGESEN. How do you account for the fact that on this other only a few scattering places in the North and West are covered practically the solid South is included?
. SMITH. Dr. Knapp will discuss that.
. TRUE. I can say, briefly, that the work in the Southern States been going on for a much longer time than in the Northern s. It was organized there more than 12 years ago.
. HELGESEN. Under that boll-weevil item, was it not?
. TRUE. Yes, sir. In the Northern States it is only about four old, and that fact accounts for it.
. HELGESEN. There is comparatively no increase in the appro- ion for the North, although the work is increasing. Your work South has been running three times as long as the North, and uld look to me as if the North ought to be getting some addi- l appropriations in order to increase the work in that section.
. TRUE. That is for Congress to say.
. HELGESEN. Congress will say, but do not forget that we are g our action upon estimates in the department. If the depart- does not ask for it they will not get it. If you claim the North ting all it is entitled to, it is a pretty hard proposition for us to against. I would like for you or somebody else to explain to hy it is, taking the area actually covered in the South, that they etting more than four times as large an appropriation as the —that is, considering the fact that they have had it for 10 or ars.

TRUE. With regard to the appropriation estimated by the de- ment, the work in the South was started under appropriations by the Congress directly to the department, supplemented by furnished from the private corporations. Congress decided t should be wholly a public enterprise, and they added to the priation in the South an amount equivalent to that contributed private sources. The work in the South had by that time to such dimensions that that amount of money was needed to on the work in the Southern States successfully. About that he extension act was passed and that brought in a large sum of y in addition, which was spent in both Northern and Southern s and which is now based in large measure on the allotments ling to rural population. That matter was discussed in Con- at the last session and the conclusion was reached with ref- to the amounts of these appropriations. I think the Secre-

tary will discuss the appropriation [illegible] before the committee.

Mr. HUTCHESON. What is the [illegible] In one place it is demonstration [illegible] cotton belt, including the [illegible] ington, etc., in cooperation with the S you do not say anything about cooperat you get down to it it says "and [illegible] untarily contributed by State [illegible] sociations of farmers and [illegible] boards of trade, chambers of commerce business men, business organizations State." Why put that in the one and not

The CHAIRMAN. Doctor, the department to do with that. That amendment was Senate two years ago. I think it is good and as it actually works out, I think it

Dr. TEAGUE. The same principle is follow

Mr. HUTCHESON. Can you furnish to t the record the amount of money that y and how much money has been contrib money that you spent there and similar

Dr. TEAGUE. That has already been done

Mr. MCLAUGHLIN. This work was star it was started in the North, the organiz large number of men are employed and t ment does not think it advisable to brea discharge those men; and perhaps the South in regard to this work as in con Government an unwillingness of the me from the service.

Mr. HUTCHESON. That may be true, bu the department stand here and gives as more than 10 per cent of the farmers i demonstrating in the North are not gett me as if the North needed some aid. W with the South. If the South needs it a it; I will vote for anything; but I do not discriminate, make two items, and tre giving to the North only about one fou to the South, when the conditions as brou our witness how that 90 per cent of th

The CHAIRMAN. As a matter of fact, bill until Capt. Lamb became chairman the item for work in the Northern States

Mr. MCLAUGHLIN. Chairman Lamb?

The CHAIRMAN. Yes.

Mr. MCLAUGHLIN. As the chairman nobody stood against that appropriation Lamb.

The CHAIRMAN. I say that was the tim

Mr. HAUGEN. You have this amount $6 takes in about one-fourth of the land are only $378,240 for the North and West?

RUE. Yes, sir.
e is one other important consideration with reference to the
n States. You will note that the Southern States appropria-
connected with an effort to overcome the disaster threatened
South because of the ravages of the boll weevil. There is a
ere impending disaster threatened over a large section of
, and it was natural, it seems to me, for Congress to take the
it did.
AUGEN. But the boll weevil goes on unmolested and undis-

cLAUGHLIN. They are getting the habits and life history of
weevil; they are taking a census and getting a pedigree of
e of them.
HAIRMAN. Like they are of the prairie dogs.
mith, suppose you go on with your boys' and girls' club work.
, in regard to matters of big policy like this, it is rather em-
ing to the chiefs of these bureaus to be asked these questions,
they are really not so responsible as the Secretary of Agri-
He will be here in a few days, and I think you ought to
these questions until then. That is my own feeling. Of
if members want to ask questions, they are privileged to

AUGEN. After all, when questions are asked, we are told
re is a later explanation to be made, and unless you do ask
s while the matter is in hand you do not get the information.
HAIRMAN. What we have Mr. Smith and Mr. Knapp here
o tell us what they are doing with the appropriations, leav-
tters of policy to be worked out by the Secretary of Agri-
He is the responsible man, at least, although I suppose
he help and advice of the bureau chiefs.
ELGESEN. If you had any more money to spend in the North
think you could spend it intelligently and beneficially in your

MITH. I think so.
ELGESEN. You think your work has not been extended as
t have been because of the lack of funds?
MITH. That is particularly true in the West, where it costs
5 per cent more to carry on the work than it does in other
the country.
ELGESEN. Will you furnish the committee with a statement
much you, in your opinion, think the North ought to have
work for the coming year?
MITH. With the approval of the Secretary; yes, sir.
ELGESEN. This committee has the right to ask for informa-
ether the Secretary wants it or not.
UBEY. You are asking him how much he ought to have.
how much he can use.
ELGESEN. I think we should know how much ought to be
the North, considering the conditions and the organization
ve now got, in order to do the effective work that they ought
in that country. The Secretary would not know anything
hat if you asked him. He would have to go right back to
ith to find out anyway.

[illegible]

[illegible] in the North I have [illegible]

[illegible] in the North [illegible]

[illegible] in the South [illegible]

[illegible] in the South [illegible]

[illegible] in the South

nt by States of such States as have reported. The cost of the ork, the lines of work that they are carrying on in each of the , the highest yield per acre by the boys' and girls' clubs in lifferent enterprises, the average yield on an acre basis, and the e net profit—all of that information is contained in a table f two pages or more in length. I do not know whether you have me go over it in detail.

CHAIRMAN. Do you want that put into the record? We are g a large record. Have you a summary of that work in your l report, Dr. True?

TRUE. We will have when the annual report is prepared.

CHAIRMAN. I mean for the past fiscal year—1915?

TRUE. They have not made any report of the extension work

CHAIRMAN. I would call attention of the committee to the at the Secretary's report, pages 43 to 45, inclusive, has a general ary of this work, which I think will give the necessary in- tion, including the figures.

McLAUGHLIN. Those are nothing like the figures Mr. Smith ve.

CHAIRMAN. Do you want these figures?

McLAUGHLIN. I think they ought to be printed.

CHAIRMAN. All right; the figures will be printed.

e data referred to follows:)

esults in boys' and girls' club work in agriculture and home economics in the Northern and Western States for the calendar year 1915.

	Total enrollment.	Total number reporting to date.	Total cost of all club work.	Total value of all club products.	Leading projects.	Highest yield per acre.	Average yield (acre basis).	Average net profit (acre basis).
ut..	3,129	1,145	$4,691.43	$11,949.41	Corn.....bu..	116	80	$57.90
					Potato.....bu..	310	208.4	118.22
					Garden and canning.....lbs..	[1] 4,831	[1] 3,231	51.41
....	2,945	805	3,567.08	14,328.50	Corn.....bu..	98.20	58.41	23.60
					Sorghum...bu..	75.50	44.39	18.13
					Potato.....bu..	432	320	160.00
....	[2] 22,776	391	12,038.00	3,919.83	Potato.....bu..	497	426	193.96
....	7,840	184	5,780.00	[3] 11,537.28	Corn.....bu..	127	62	36.65
					Potato.....bu..	384	277	83.65
....	1,389	607	3,000.00	4,790.97	Corn.....bu..	77.72	64.74	12.61
					Potato.....bu..	288	153	37.18
....	440	43	2,357.00	1,322.93	Sorghum...lbs..	5,049	3,759	106.13
....	8,110	2,902	5,305.00	97,260.00	Corn.....bu..	88.6	30	12.00
					Potato.....bu..	605	224	60.00
....	629	193	3,071.00	2,782.28	Potato.....bu..	640	242	137.78
					Garden and canning.....lbs..	[1] 3,320	[1] 576.6	[1] 27.27
....	2,689	46	2,575.04	1,311.71	Corn.....bu..	60	24	18.15
					Potato.....bu..	520	254	115.04
					Garden and canning.....lbs..	[1] 4,522	[1] 2,140	[1] 73.90
kota	2,486	891	2,420.24	2,280.25	Corn.....bu..	81.75	38.5	8.11
					Potato.....bu..	210	152.5	5.88
....	684	554	3,630.00	14,695.87	Corn.....bu..	74	50	37.70
					Potato.....bu..	592.5	142.6	60.00
					Alfalfa....tons..	10.3	7.4	24.50
....	24,468	1,888	3,358.68	66,942.45	Potato.....bu..	646	440	132.00
					Sugar beet.tons.	32	18.5	43.93
					Garden.....lbs..	[1] 3,030	[1] 1,965	[1] 24.00

[1] Figures based on $\frac{1}{10}$-acre plat instead of acre basis.
[2] Of this enrollment 15,000 were in the market garden work.
[3] Estimated value of all products by the 184 members reporting.

Some results in boys' and girls' club work in agriculture and home economics in the Northern and Western States for the calendar year 1915—Continued.

State.	Total enrollment.	Total number reporting to date.	Total cost of all club work.	Total value of all club products.	Leading projects	Highest yield per acre	Average yield per acre basis	Average profit per acre basis
Massachusetts.	69,300	51,235	$8,791.99	.....	Poultry...eggs.	82.2	54.17	$19.28
Iowa	11,780	5,235	8,628.82	$149,806.97	Corn.....bu.	150	62.2	.....
					Potato.....bu.	250	170	2.4
					Garden and canning, lbs.	2,524	648	12.9
					Home garden, lbs.	1,650	648	1.8
New Mexico	874	58	2,970.75	720.62	Corn.....bu.	75	45	15.8
					Milo maize..bu.	40	32	4.8
					Garden and canning, lbs.	450	340	15.3
Colorado	2,691	1,620	3,640.00	8,000.00	Corn.....bu.	85	65.8	20.6
					Potato.....bu.	240	187	6.3
North Dakota	1,428	282	3,463.74	6,227.19	Corn.....bu.	90	47.5	3.6
					Potato.....bu.	288	224	12.8
Nebraska	5,808	462	8,401.18	8,575.96	Corn.....bu.	107	69.33	11.6
					Potato.....bu.	360	162	5.8
Michigan	1,252	329	3,792.00	13,253.00	Corn.....bu.	140	87	17.1
					Potato.....bu.	420.44	225	20.5
					Garden and canning, lbs.	45,300	.....	6.8

[1] Of this enrollment 66,195 were engaged in market garden and home-garden work, which consist of small areas and in canning and marketing where no club plat was required.

[2] Massachusetts poultry club work covers a period of 100 days. Figures show the rate per hen-year this period.

[3] Figures based on ⅛ acre-plat instead of acre basis.

[4] 10,800 square feet in plat

Total cost of all club work is the total cost to State and Federal Government from all sources.
Total value of all club products is based upon those making a complete report only.

During 1915, 1,237 canning demonstrations were conducted by those in charge of the garden and canning clubs in the States, of which number 317 were conducted in the field by the Washington field force. A total attendance of 119,300 was reported at these demonstrations, which were held at State, district, and county fairs and local club meetings. There were 87,788 members enrolled, of which about 66,000 were in Massachusetts, 5,000 in Utah, 3,000 each in the States of Oregon, Indiana, and Idaho, and smaller enrollments in most of the other States. The 52,715 club members reporting on December 1 had canned 136,700 quarts of products during the season, and it is estimated that the value of all garden products, both fresh and canned, by members reporting was $57,487.82.

In addition to this work, the office received during the year 26,534 requests for recipes and assistance in home canning. A questionnaire was sent these parties recently, and the first 1,809 reports received showed a total of 439,548 quarts of fruit and vegetables canned during 1915 according to methods advocated by the department. Of this amount, 227,855 quarts were vegetables and greens and 211,693 quarts fruits. The significance of these figures is in the large number of quarts of vegetables and greens canned, which indicates an improvement in the family diet. These figures do not include fruit juices or soups canned during the period.

A total of 12,318 members was enrolled in the poultry clubs of 22 States last season, either in the egg-laying or chicken-raising project, an increase of 3,158 over the preceding year. Of this enrollment, 3,400 were in Connecticut, 2,840 in Utah, and approximately 1,000 each in Indiana, Massachusetts, Idaho, Oregon, and Colorado. The value of all products by club members reporting was $11,909.75 from the 10 States from which these data were available. In Massachusetts 380 club members completed all work outlined. The 5,857 hens entered produced 311,280 eggs. The gross receipts were $7,709.48, and the net profit was $3,651.82, or 62.3 cents per hen.

In the pork and crop-production club work emphasis is placed upon the raising of at least a portion of the feed for the animals. An enrollment of 4,169 members was quite evenly divided between 17 States, while the value of all club products from 13 States reporting was $34,646.65.

. SMITH. I want to mention here, as bearing on the item for
nistration that was discussed this morning, that these men who
dministering the club work and have headquarters in Washing-
ave themselves carried on 317 demonstrations out in the field
ng teach the State leaders and the local leaders just how to do
work, and standing up before groups on the farm and in the
en showing how to can the different kinds of vegetables, corn,
s, and fruit, in tin and otherwise; so that it is actual demon-
on work as well as administration work that they do.
is in a general way covers the club work, though very in-
ately. Mr. Benson is here, if you care to ask him any questions
gard to it.
. HAUGEN. I judge from your statement that you have been in-
g the domain of other bureaus to some extent when you speak
at plants to plant and what soil to plant in.
TRUE. No; we do not invade the jurisdiction of the other bu-

. HAUGEN. The Bureau of Plant Industry considers that it is
ty and its function to study the plants and to tell the people
emonstrate to them what plants to plant and so on?
TRUE. Practically all of the demonstration work is centering
the States Relations Service.
HAUGEN. You are doing the demonstration work for the other
us?
TRUE. It is done through the States Relations Service.
HAUGEN. So there is really cooperation between your bureau
he Bureau of Plant Industry and Bureau of Soils?
TRUE. Yes, sir.
HAUGEN. And no demonstration is being done by the different
us?
TRUE. Those bureaus are doing some demonstration work, but
peration with the States Relations Service.
HAUGEN. That is my understanding; that is why I am asking
uestion; and the object in asking it is to ascertain how much
cation and overlapping and unnecessary expense can be dis-
d with.
TRUE. There is probably no duplication.. They are carrying
work on in accordance with a plan that has been approved
e States Relations Service and with the same organization
n the State. The only way in which there may be some duplica-
s in certain lines of investigational work within the States, but
s rapidly decreasing.
HAUGEN. Then, we understand from your statement that you
rrying on the demonstrations for the bureaus and that there
duplication of work?
TRUE. Yes, sir.
CHAIRMAN. We are much obliged to you, gentlemen.
committee will now recess until 3 o'clock this afternoon.
hereupon, at 12.45 o'clock, the committee took a recess until
ck p. m.)

AFTER RECESS.

committee reconvened at 3 o'clock p. m.
CHAIRMAN. I will ask Dr. True to take up item 27.
TRUE. Mr. Knapp is in charge of that.

[illegible]

STATEMENT OF MR [illegible] IN [illegible] OF EXTENSION WORK IN THE SOUTH [illegible] SERVICE.

[illegible]

Mr. [illegible]. Mr. Chairman, I [illegible] I [illegible] I [illegible]

nature of the complicated duties of the office, it is impossible to say ow much of the work is supervisory and how much of the work is

l, Washington office:

ory salaries	$31,120
fund salaries, expenses, supplies, etc	56,520
Total	87,640

Administration.

Items.	Statutory salary.	Lump fund.		Total.
		Salary.	Expenses.	
(½ salary and travel)		$2,400	$720	
ief (½ salary and travel)		2,100	540	
29 clerks)	$25,280			
12 clerks)		9,440		
xpress, etc			425	
nd equipment			8,725	
and telegraph			200	
dministration or supervisory work	25,280	13,940	10,610	$49,830

Projects of field work—Washington expenditures.

Items.	Statutory.	Lump.		Total.
		Salary.	Travel expenses.	
ork:				
fice (two-fifths time in field: salary and travel)		$1,600	$480	
chief (two-fifths time in field: salary and travel		1,400	360	
Assistant Secretary's office)		2,250	500	
		5,250	1,340	6,590
UNTY-AGENT AND BOYS' CLUB WORK.				
rist, 1 assistant chief (Texas, Oklahoma, Missis- labama, Georgia, Florida, and South Carolina)		2,760	1,200	
rist and field agent (North Carolina, Tennessee, s, and Louisiana)		2,760	1,000	
rist and field agent (Virginia, Maryland, West , and Kentucky)		2,760	1,200	
rk (all Southern States):				
rist (one-half salary and travel)		1,500	450	
rist and field agent		2,400	1,000	
or above:				
	$3,940			
unty agent and boys' club work	3,940	12,180	4,850	20,970
STRATION WORK, INCLUDING GIRLS' CLUB WORK.				
rist (one-half salary and travel)		1,500	450	
in girls' canning clubs and home-demonstration		2,400	1,000	
		1,800	1,200	
or above:				
	1,900			
ome-demonstration work, including girls' club	1,900	5,700	2,650	10,250

TOTAL FOR PROJECTS OF FIELD WORK.

(salaries and expenses)	$31,970
	5,840
d total, field projects	37,810

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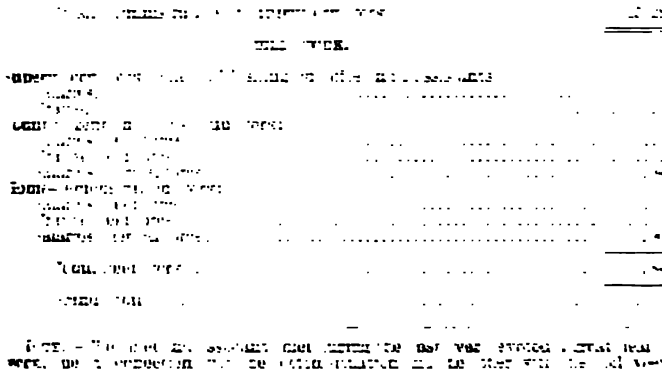

Mr. KNAPP. The next item I suppose you want
the relation between the work of the department
the colleges under the Lever Act.

The CHAIRMAN. Dr. True has rather fully expla
would rather have you take up the county agent and

Mr. KNAPP. This office has been engaged in the
since 1914, with gradually increasing funds from
until about three years ago. We have had no increa
appropriations, as a matter of fact, in three years. The
from the General Education Board funds to the dep
two years ago, as the committee will remember, to
increase the amount of funds handled by the office.

The CHAIRMAN. Let us see if I can get my head
on that point. This fund, until this proviso was p
was something like $50,000 or $75,000?

Mr. KNAPP. Three hundred and seventy-five thou

The CHAIRMAN. This proviso, then, meant that t
was to take over the work which had been financed

ıe CHAIRMAN. The increase in the appropriation was equal to
ımount that had been contributed theretofore from other sources?
r. KNAPP. As a matter of fact, Mr. Chairman, I think there was
ght increase at the time that money was added.
he CHAIRMAN. The clerk of the committee calls attention to the
that there was a small increase added, in addition to that, for
e tobacco work in Kentucky.
Ir. KNAPP. Not for tobacco work, but to take care of the develop-
ıt of the work in Kentucky——
'r. TRUE (interposing). And three of the Northern States.
[r. HOWELL. Do these associations that formerly contributed to
r work now carry on work on their own behalf?
r. KNAPP. This amendment was aimed at the General Education
rd fund. That was entirely cut off, and they are not engaged in
agricultural work except a little bit of work for the negroes
ied on through certain school organizations in the South.
r. HELGESEN. How much was their contribution?
r. KNAPP. Two hundred and fifty thousand dollars.
r. HELGESEN. A year?
r. KNAPP. It increased from the beginning. It began with $7,000;
it kept increasing from year to year until it reached that figure.
r. HELGESEN. You just stated, Mr. Chairman, that if the Gov-
ıent had not taken this over it would have all died out. Does
mean whenever the Federal Government ceases to furnish
ey for this county work the States will never get where they
sustain it?
he CHAIRMAN. My position is that if that fund of $250,000 had
cut peremptorily it would have, in a way, greatly disorganized
force and some agents necessarily would have been dropped?
r. KNAPP. A large number; yes, sir. The work would have been
in two at that time. Since that time, Mr. Helgesen, the total
l has not been increased from this department.
r. HELGESEN. At that time did the General Education Board
the entire expenses of the work, or did the States pay part of it?
r. KNAPP. In each State where General Education Board funds
e used the counties or some local organization paid from one-half
wo-thirds of the salary and expenses of the county agent for
ı county, just as was the case where Government funds were used.
r. HELGESEN. Under this appropriation now, how much money
ou get from other sources than this to offset the amount of money
spend down South?
r. KNAPP. Practically $595,000. I can give you the exact figures,
ou desire them. They are as follows: From counties, $460,584.54;
ı States, $40.597.50; from colleges, $30,141; and from individuals
communities, $64,130.38; a total of $595,453.42 for county agents,
e demonstration work, and boys' and girls' club work.
r. HAUGEN. How is that paid—by taxation?
r. KNAPP. Yes, sir; by taxation.
r. LEE. And by individuals.
r. KNAPP. Yes, sir; every State in the South except Georgia and
th Carolina have passed laws authorizing county courts or boards
upervisors to make appropriations to engage in this work in co-
ation with the department. Those two States have not done so

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[illegible]

[illegible] constitutional

[illegible]

[illegible]

[illegible]

ck industry in the areas freed of cattle ticks. Are you doing any rk independently of or in cooperation with the Bureau of Animal dustry?

Mr. KNAPP. It is being done by cooperation between the Bureau of imal Industry and my office.

Mr. MCLAUGHLIN. How many men of yours are employed coop- tively?

Mr. KNAPP. No men paid from this fund are receiving any salary m the fund you mention.

Mr. MCLAUGHLIN. I mean how many are working in the same area?

Mr. KNAPP. They have certain specialists in animal husbandry en- ed in conducting work with beef cattle, dairying, and possibly raising. I am not sure, but I think generally they have two types specialists, one covering the dairy interests and the other the live- k interests, including hogs, cattle, etc. Those are located in the as freed of the ticks, and they work through the county agents; t is, they get their contact with the farmers through the county nts in all counties were there is an agent. Where there is no nty agent they work with farmers directly.

Mr. HAUGEN. Can you explain to us in what respect the work dif- rs?

Mr. KNAPP. They do not deal, to amount to anything, with crops. e county agent takes up the problem of the production of forage ps, etc., to support the live stock.

Mr. HAUGEN. Your aim is to assist in stock raising as well as in owing grain?

Mr. KNAPP. Yes, sir.

Mr. HAUGEN. Why could not all that work be done by your people?

Mr. KNAPP. For this reason: You get hold of a man who is well formed on practical southern agriculture and knows the crop part farming in the South and he is not apt to be an expert in dairying, cause dairying is new to that territory. We need the assistance of n who are experts in dairying to guide the county agents and rmers through the problems of the animal-husbandry work.

Mr. HAUGEN. Does it require expert knowledge to go out and tell se people to start with certain animals, or do you go out and select animals for them?

Mr. KNAPP. No, sir.

Mr. HAUGEN. Does the other fellow do that—assist them in buying?

Mr. KNAPP. No, sir; but possibly they tell them where they could rchase, and they generally encourage the purchase of pure-bred les to be brought into that territory to cross with the native stock the improvement of the live stock.

Mr. HAUGEN. That would not require any expert knowledge—ply telling them to buy full-blooded animals?

Mr. KNAPP. If you come with me into the South, I think you will d we need that expert knowledge. I have seen a good many cases ere northern people shipped down their bulls and sold them at rbitant prices.

Mr. HAUGEN. Yes; but they are doing that everywhere.

Mr. KNAPP. With a certain amount of expert information from the ecialists. we can protect the farmer from being cheated with in- ior animals where he does not know about that. He will take

Mr. KNAPP. Not at all. For example, there is only one man in f-cattle work in the State of Arkansas, in the tick-freed area, if a are talking about that appropriation. There is only one man in t whole territory.
Mr. MCLAUGHLIN. How do they use $50,000?
Mr. KNAPP. Oh, there is another man for the territory in Mississi, another one in Georgia, and perhaps one in Tennessee, one in th Carolina, and one in North Carolina.
Mr. EVANS. He is asking about the appropriation for the Louisiana rk.
Mr. MCLAUGHLIN. The Louisiana work is a different work. It is ifferent appropriation.
Mr. STEELE. I am interested in the advice you are giving the south- fellows about the quality of cattle they should buy. Is that a t of your work?
Mr. HAUGEN. Let us get the other cleared up first.
Mr. STEELE. This duplication is what I want to know about. Now, a go down and tell the fellows what type of bull to buy——
Mr. KNAPP (interposing). That is, the specialist; yes, sir.
Mr. STEELE. And our people from the North go down and buy in tain parts of the South these knotheads, and purchase them by carloads and bring them up into our country and sell them off as rlings. Do you follow that up to protect that buyer there? aughter.]
Mr. KNAPP. No, sir; but ultimately, Mr. Steele, there will be tain communities where you can buy grade Herefords, because actically every bull brought into the community is a Hereford, ich are crossed with the native stock and you get a grade Here-d. Ultimately, we can place you in touch, or the Office of Mar-s can place you in touch, with communities where that kind of ck is for sale.
Mr. STEELE. That is part of my business—in fooling the other low sometimes—but I buy up a lot of grade bulls and take them wn there for sale——
Mr. REILLY (interposing). You might find a place down there for Iowa bulls where they can be placed to advantage.
Mr. STEELE. Is it your idea that they shall be present at the sales d tell these people not to buy this bull, for example, because it is t up to the standard?
Mr. KNAPP. No, sir. For example, the Angus Breeders' Associan are holding certain guaranteed sales. I think if you will ask Bureau of Animal Industry that Mr. Rommel, the chief of that vision (who is, by the way, from Iowa), will tell you of a per-ted arrangement where the Angus people sell as an association d guarantee to the farmer that this stock is what it is represented be and that they will take back animals that fall down in the ed.
Mr. STEELE. You do that in the educational schools, don't you?
Mr. KNAPP. Yes, sir.
Mr. STEELE. That is as far as you can go?
Mr. KNAPP. Yes, sir.
Mr. HAUGEN. That is a common practice all over the country, is not?
Mr. KNAPP. For them to have associations?

Mr. KNAPP. If a [illegible] properly train
Mr. HAWKEN. How much training is nece
Mr. KNAPP. There is the danger of killin
properly.
Mr. HAWKEN. They have a formula for th
Mr. KNAPP. Yes, sir.
Mr. HAWKEN. What is the formula?
Mr. KNAPP. I do not know. You will ha
[illegible] that.
Mr. HAWKEN. After it is mixed, it does
it does it?
Mr. KNAPP. No, sir; I do not know that it
Mr. HAWKEN. It is just a matter of physic

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Mr. KNAPP. Partly.
Mr. HAUGEN. Does it require a veterinarian to run them through
e vats?
Mr. KNAPP. No, sir.
Mr. LEE. Every time you fill the tank you have to test the contents
the tank, don't you?
Mr. KNAPP. Yes, sir. This fund pays for the men who are clean-
g up the county—the men who see to it that the farmers dip who
not want to dip the cattle.
Mr. HAUGEN. But I contend that anybody can do that. All that
ecessary is the money to buy the dope.
Mr. KNAPP. Suppose you were in a county where many people are
posed to getting the tick out—who believe that God Almighty put
em there and that they should not be removed?
Mr. HAUGEN. With reference to this duplication of work, my un-
rstanding is that we appropriate money, and you employ men to
into the various counties, and some other bureau sends men there
educate your people.
Mr. KNAPP. Only to give technical help on certain problems.
Mr. HAUGEN. To what extent is that being done?
Mr. KNAPP. That is being done, as I understand it, in every State
the United States. It is being done under the provisions of the
ver Act in every State. They are furnishing certain specialists to
al with special problems.
Mr. HAUGEN. What appears to some is this: We appropriate
oney for the many bureaus in the department. One bureau sends
t its agents to do a certain thing, and another bureau sends out
other agent to do the very same thing. To some of us it looks like
plication of effort. It appears to me that this line of work ought
be consolidated under one head. It was my understanding a
ar or two ago that this demonstration work was to be brought
der one head and put under the supervision of this States Rela-
ns Service.
Mr. KNAPP. In my judgment, all extension work ought to be
ought under one head.
Mr. HAUGEN. Is it possible to do that?
Mr. KNAPP. I think it is possible to do it.
Mr. HAUGEN. Then we ought to dispense with this duplication of
rk.
Mr. KNAPP. If there is any duplication, it should be dispensed
ith.
Mr. HAUGEN. If one bureau sends a man, for instance, to South
arolina to do dipping and another bureau sends a man there to
the same thing, it seems to me that is a duplication of work and
volves the expense of sending two men instead of one.
Mr. KNAPP. The Bureau of Animal Industry has to do with the
lice work of cleaning up the county of ticks, and, if you followed
at out, you would find in actual practice in the South that if you
pended upon the county agent to enforce the quarantine, it would
but a short time before the farmers would be against your county
gents, because many people resent the quarantine.
Mr. MCLAUGHLIN. I think you are getting away from the question.
his appropriation we are speaking about is not the quarantine ap-

propriation. It is the $50,000 to assist in encouraging men to ra
live stock in areas free from ticks.

Mr. KNAPP. As to that provision. I will state that those men a
dealing simply with animal-husbandry problems, working throu
county agents and helping them in the breeding problems.

Mr. MCLAUGHLIN. How long do you think it will be before t
county agents will know enough to suggest to the farmers that
will be well for them to buy pure breeds of bulls?

Mr. KNAPP. That is not all. They have made that suggestion
years, but if you go down into the field you will find that you have
only the breeding problem but the problem of feeding the live st
Now, let us go into any county. It has been, let us say, for 50 y
a cotton-producing county alone. These people do not unders
the feeding of live stock. If you want to send a live-stock speci
there, he does not know anything about cotton. He does not k
how to raise cotton. The county agent must be a man who know
type of farming the people are carrying on there, or else he is no
to us. Therefore, we have to supply him with some expert inf
tion with reference to live stock, with which he is not acquainte

Mr. HELGESEN. Suppose this is put on the same basis as
business is conducted. You take some jobbers in the country
evade the wholesalers and deal with the retailers. They all h
deal through traveling men. The traveling men are supposed
competent salesmen, and each year they learn something.
customary in every section of this country to call those men
stated intervals. There are new goods to put on the mark
new business problems to meet. These matters are all discusse
the traveling men, and when they get through, in a couple of
they feel they are competent to be sent out to deal with th
problems and present the new ideas to the public. It costs mu
to handle the matter in that way. It seems to me it is much
than sending out men to follow them up all over the countr
ing them what is right and what is not right about their bu
The way it is done in these other businesses is much more e
and less expensive. Is it not possible to call these county m
together each year and have the experts go there and tel
what is the new information, instead of having a lot of spe
go chasing after them telling them what they should do?

Mr. KNAPP. You saw the chart given by Mr. Smith illus
the splendid work he has done with the highly trained n
county agents. He said he had to send experts to teach th
particular work they are engaged in.

Mr. HELGESEN. Suppose he is doing it. I am not findin
with the South. I am finding fault with the system that p
in the department. Why not call those people all together?
would not need half the money you need for your specialist

Mr. KNAPP. In my judgment, we need a few well-trained s
ists. I do not think we need a very large number. I am not
to attempt to state anything now, because it might be constru
criticism of other bureaus of the department by saying that w
too many or too few, but we need a few well-trained men.

Mr. HELGESEN. One trouble with every department in thi
ernment is the proposition you just referred to. We do not w
say anything that might be interpreted as stepping on some

rtment's corns, but we are here to appropriate money, and we ıot appropriate money intelligently unless we know about these gs.

. KNAPP. I am not the authority that fixes the policy of the ed States Department of Agriculture; but if there is any one g we do need it is more of a centralization of certain specific lines ork. I think the Secretary is at work on that problem.

. HELGESEN. I think you have voiced the sentiment of the com- e.

. KNAPP. If the States Relations Service is to take up the work een the States and the Federal Government and cooperate in ork, it should have all relations with the States under it. I t we are making progress in that direction. You may meet ieeds of a county one year with an agent and the next year

. ANDERSON. But every farmer has to learn that.

. KNAPP. Yes; but suppose you get a plant disease——

. ANDERSON (interposing). Oh, that is another proposition. are talking about ordinary farming operations—feeding the and breeding the cattle, and things of that kind—propositions every farmer has to know. He does not only have to know how eed a cow but how to feed the bull.

. KNAPP. In Minnesota they all know that, but in some other s they do not know how best to do it. We are trying to show

. ANDERSON. If you come up into Minnesota we will furnish you nber of men who can tell you how to do that.

. OVERMYER. And will they do that without pay?

. KNAPP. And some of them might fall down ingloriously in lating their information from terms of Minnesota into terms lorida.

. OVERMYER. These things cost money, and if they are worth we should be willing to appropriate the money.

. ANDERSON. Are you going to have them, regardless of how they cost?

. OVERMYER. If they have any value we ought to appropriate hem, and if they have not we do not want to appropriate for . Of course, it is proper to inquire into every item.

. HAUGEN. What is the need of sending these specialists into eld?

. KNAPP. As I state, we need these specialists simply to meet special problems.

. HAUGEN. That is being met in the laboratories here in Wash- n; it is being worked out here. Why is it necessary to go into ields? It is not necessary to go into the fields to demonstrate it?

. KNAPP. That is what we have to do.

. HAUGEN. As I understand it, demonstrating is your part of ork, and for others to investigate?

. KNAPP. Yes, sir.

. HAUGEN. We were told when the appropriation was first sug- d that in making the appointments only practical experienced would be selected?

Mr. KNAPP. Yes, sir.

Mr. HAUGEN. Is it the policy of the Government to go into the field and select practical, experienced men, or is it to pay special attention to stump speakers and politicians?

Mr. KNAPP. No men are selected for political reasons. The men in my territory average in salaries to-day $1,300 per county, and they pay out of that salary all traveling expenses.

Mr. HAUGEN. In your selections, who do you appoint?

Mr. KNAPP. I personally do not select anybody.

Mr. HAUGEN. Somebody does?

Mr. KNAPP. Yes, sir; and that selection is made just as Mr. Smith explained it was made in the North. Our representatives in the South select the men on the basis of, first, their practical experience in the type of agriculture of the county to which they are going, and, secondly, their scientific training. We want to get the best-trained men we can, with the best information and experience back of him. If it is possible to get an agricultural-college graduate with sufficient actual farming experience, that is the man to take.

Mr. HAUGEN. If you can not get him, you take the other fellow!

Mr. KNAPP. The most successful farmer that we can get.

Mr. HAUGEN. How much attention is given to practical farming in selecting these men?

Mr. KNAPP. I might say that we do not put any direct percentage on it.

Mr. HAUGEN. They do give credit for experience in other departments.

Mr. KNAPP. We would give weight to practical experience. For instance, a young college graduate, with a diploma in agriculture, would not be selected unless he was born and brought up on a farm and had practical experience. As a general rule, he is not selected until he has been out of college long enough to have some practical experience; because, as Mr. Smith has illustrated, farming is a business, and he must have some business experience before he can advise men in farming.

Mr. HAUGEN. How much experience is required; how much credit is given for that?

The CHAIRMAN. How many years?

Mr. KNAPP. Oh, you can not fix any arbitrary rule. Some of our men have had 15 or 20 or even more years of practical experience, some only 3 or 4 years, and some 2 or 3 years.

Mr. REILLY. Those men with practical experience are better received by the farmers than the other kind, are they not?

Mr. KNAPP. That depends on the personality of the man. If he is a real leader, genuinely devoted to the job he is undertaking, and has plenty of good, hard sense, he is going to take better than the highly trained man who is young and inexperienced in practical life, and the reason for that is his business ability, common sense, and good business advice to the farmer.

Mr. HAUGEN. What success have you had in finding men with good common sense—I mean ability to get along with the people and do effective work?

Mr. KNAPP. I should say very good.

Mr. HAUGEN. You do not have difficulty along that line?

r. KNAPP. We do have difficulty in getting the right type of because of this: The minute you get the right type of man, s you can give him an increase in salary, presently he will find n make more money on his own farm.
r. MCLAUGHLIN. Then you do not need the help of the Bureau nimal Industry, but more money. You do not want two men) along arm in arm, one looking at the corn and the other at the ?
r. KNAPP. No, sir; and we have been making steps in that direc-, Mr. McLaughlin. Five years ago the average salary of the was only about $500 per annum, and now we have raised that ry so that the average is practically, as I have said, $1,300.
r. MCLAUGHLIN. I should judge that what you want is more ey, and every member of the committee will bear me out when y that I will not begrudge money for that kind of work, but I bject to duplication of work by two bureaus—having two men certain thing where one man ought to be doing it.
r. KNAPP. Mr. McLaughlin, I am just as much opposed as any- can be to overstocking in specialists anywhere.
r. MCLAUGHLIN. I have been rather surprised with the situation ne North, and I suppose it is true with the South—that it has possible to find as good men as have been employed and I am ing for the time when their salaries must be increased; but if e men are not good enough in the North to carry on this sort of onstration work, I shall object to putting money into another au to send other men there.
r. HAUGEN. I want to take exception to this salary proposition. ou consider $1,300 a low salary?
r. KNAPP. For a man to support his family and pay his expenses aveling over the county, it is.
r. HAUGEN. Oh, they are all supposed to support their families.
r. KNAPP. I certainly do expect them to.
r. HAUGEN. How does that salary compare with the salaries on the farms?
r. KNAPP. I can say that the best of our men are often taken r.
r. HAUGEN. I do not think that enters into this matter. They employed to work in connection with the farms. I understood to say that if the salary is not increased they will go back to arm and make more money?
r. KNAPP. Yes, sir.
r. HAUGEN. We had a table here this morning that explained alaries and profits on the farms.
r. KNAPP. Yes; and in one of the columns you will find that after ng their living they have over $1,200 income.
r. HAUGEN. Now, how does that salary compare with the wages on the farms?
r. KNAPP. You mean income?
r. HAUGEN. I mean wages paid to good practical managers of ıs.
r. KNAPP. I mean that these men can leave their positions and go on the farms and make their living and get a net out of it more they are getting out of their salaries at present.

p, will you kindly tell us what you are

ork being pursued are as varied as it is
oll-weevil territory and in all the cotton
e conducting demonstrations in the
te the growing of cotton under boll-
veevil territory the growing of
s you will remember, in the
of the problem in meeting
abit of calling diversifi-
en along that general
-first, diversification,
boll-weevil conditions.
along that line. If you will
crops in the South you will see
ion but a constant increase of other

ll necessarily mean an increase in the total

here is a great deal of land not yet under
The average farm in the South is from
ich about 35 to 40 acres is improved land.
e been an increase in the acreage recently?
e high point was 1911 in cotton, and there
ease in acreage from the years 1914 to 1915.
that due to the fact that they had a very
ble because of the war?
ut there were increases in the other crops
he following table showing production of
in 11 cotton States.
llows:)

of corn, oats, wheat, and hay in the 11 cotton s, Florida, Georgia, Louisiana, Mississippi, North Carolina, Tennessee, and Texas for the years

Corn.	Corn.[1]	Oats.	Wheat.	Hay.
Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Tons.*
461,536,000	291,755,000	51,847,000	28,622,000	3,108,000
664,752,000	432,912,000	90,577,000	55,120,000	3,428,000
533,136,000	437,898,000	65,506,000	34,619,000	2,611,000
685,332,000	430,155,000	90,659,000	46,829,000	4,295,000
658,252,000	447,802,000	97,237,000	51,009,000	4,214,000
610,851,000	436,051,000	102,685,000	85,188,000	4,577,000
812,883,000	513,908,000	157,714,000	88,842,000	6,269,000

States named above other than Texas and Oklahoma.

was interested to learn was whether that
s caused by the cotton acreage being taken
or whether it was new land that had been

both. Some of the cotton land has been
t there is new land being put under the
alf of the farm is unimproved. Wherever

Mr. HAUGEN. More than $1,300 salary?

Mr. KNAPP. Yes, sir.

Mr. MCLAUGHLIN. If they are any good they can.

Mr. HAUGEN. I am afraid you have not had much experience in farming.

Mr. HOWELL. A great many of the men are working farms of their own, are they not?

Mr. KNAPP. No, sir. These men's time is so taken up they can not run their own farms.

Mr. HAUGEN. Are they people who have failed in their own efforts in farming?

Mr. KNAPP. Not at all.

Mr. HELGESEN. As a practical proposition, Mr. Chairman, ideal men can not be secured in sufficient numbers in any line of business, and I suppose it is the same in this line of work. You have to do the best you can with the money you have. I do not suppose they have the best in the South or the best in the North, because they are not there in sufficient numbers.

Mr. MCLAUGHLIN. If you found you were employing inefficient men, would you get more money to get more inefficient men or would you attempt to hire better men?

The CHAIRMAN. May I interject a remark? The fact is, we have asked these gentlemen to come here and make their statements. Now, I know I am just as bad an offender and just as guilty as any member of the committee, but we have spent most of the time in making statements ourselves to these gentlemen. We have been doing the talking and they the listening.

Mr. STEELE. I will not say a word.

Mr. HAUGEN. I want to apologize for taking the Doctor's time on this matter of duplication, but that is a matter I can not help talking about and taking some interest in. I would very much like to have it stopped.

Mr. STEELE. He is now talking just about as I am thinking.

Dr. TRUE. In reference to this duplication of work, the Secretary of Agriculture has given great attention to that very matter, and in the reorganization of the department he has endeavored to separate the different lines of work, and you will see by studying this Program of Work that those lines are much more clearly defined and separated than they have been in the past.

As far as the extension work is concerned, wherever the bureaus are engaged in such extension work they are required to put their work in the form of definite projects, and those projects must be approved by the States Relations Service as well as by the Secretary before they are put into execution.

There will always be a need for specialists to go out from the department to aid the county agents. What is the use of spending millions of dollars through the Department of Agriculture to make investigations if you have no means by which the results of those investigations may be taken out to the country and to the county agents and farmers, to inform them of the practical results of such investigations? That is what the department is trying to do, and is certainly, in large measure, accomplishing under the present arrangement.

The CHAIRMAN. Mr. Knapp, will you kindly tell us what you are ing in the field.

Mr. KNAPP. The lines of work being pursued are as varied as it is ssible to mention. In the boll-weevil territory and in all the cotton rritory the county agents are conducting demonstrations in the owing of cotton. We demonstrate the growing of cotton under boll-evil conditions, and in nonboll-weevil territory the growing of tton under better farm practices. As you will remember, in the st hearings on this appropriation a part of the problem in meeting e boll weevil is what we have been in the habit of calling diversifi-tion. The history of the whole effort has been along that general ne; that is, it has had these two things in view—first, diversification, d, secondly, the growing of cotton under boll-weevil conditions. e have had a very great deal of success along that line. If you will amine the acreage devoted to farm crops in the South you will see fluctuation in the acreage of cotton but a constant increase of other rm crops.

Mr. HELGESEN. That will necessarily mean an increase in the total rm acreage, will it not?

Mr. KNAPP. Of course there is a great deal of land not yet under e plow in the South. The average farm in the South is from out 75 to 80 acres, of which about 35 to 40 acres is improved land.

Mr. HELGESEN. Has there been an increase in the acreage recently?

Mr. KNAPP. Yes, sir; the high point was 1911 in cotton, and there s been 15.9 per cent decrease in acreage from the years 1914 to 1915.

Mr. HELGESEN. Was not that due to the fact that they had a very rge crop that was unsalable because of the war?

Mr. KNAPP. Yes, sir; but there were increases in the other crops fore the war. I insert the following table showing production of rn, oats, wheat, and hay in 11 cotton States.

(The table mentioned follows:)

atement showing total yield of corn, oats, wheat, and hay in the 11 cotton States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas for the years 1909–1915, inclusive.

Calendar year.	Corn.	Corn.[1]	Oats.	Wheat.	Hay.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Tons.*
)....	461,536,000	291,755,000	51,847,000	28,622,000	3,108,000
)....	664,752,000	432,912,000	90,577,000	55,120,000	3,428,000
l....	53[illegible],136,000	432,898,000	65,506,000	34,619,000	2,611,000
2....	685,333,000	430,155,000	90,659,000	46,829,000	4,295,000
3....	658,252,000	44[illegible],802,000	97,237,000	51,009,000	4,214,000
4....	610,851,000	436,051,000	102,685,000	85,188,000	4,577,000
5....	812,883,000	513,908,000	157,714,000	88,842,000	6,269,000

[1] Total production of corn for States named above other than Texas and Oklahoma.

Mr. HELGESEN. What I was interested to learn was whether that crease in other crops was caused by the cotton acreage being taken ıd devoted to these crops or whether it was new land that had been ıt to that use.

Mr. KNAPP. It is partly both. Some of the cotton land has been ırned to other crops, but there is new land being put under the low every year. Often half of the farm is unimproved. Wherever

you find land not under the plow it is eas
acreage.

Mr. McLAUGHLIN. You spoke of the decr
Have you anything to say about the increas
ton per acre?

Mr. KNAPP. I have the yields of cotton. I
lay my hand on the material, but there has
average production of cotton per acre, takin
In some of the States that will show a redu
boll weevil. In some States it will show an i

Mr. McLAUGHLIN. That is the result of yo

Mr. KNAPP. That is the result of the the
of demonstrations.

Mr. HAUGEN. The result depends largely
tillage, does it not?

Mr. KNAPP. No, sir.

Mr. McLAUGHLIN. What has been the incr

Mr. KNAPP. For example, the production
year to year, but in 1910 it was practically 51
per acre in the cotton territory. In 1911 it w

Mr. HAUGEN. Was not that an excepti
year?

Mr. KNAPP. It was, apparently.

Mr. FITZ. To what is the difference in th
conditions?

Mr. KNAPP. The year 1911 was a better ye

Mr. HAUGEN. These figures are somew
you have a series of years. We had last yea
crop of wheat. The farming was much bet
years before. Occasionally we get those go
give us several years, we can then see the tru

The CHAIRMAN. Can you submit those figu

Mr. KNAPP. Yes, sir. The average yield
markable advance. I have tables showing
acre of cotton, corn, oats, wheat, and hay in
1870 to date, which I can insert in the record

(The statements referred to follow:)

Cotton. Yield per acre in pounds of lint cotton, a
Southern States.

States	13-year average.								
	1866	1876	1880	1889	1890	1899	1900	1909	1912
Alabama	146	141	157	172	142				
Arkansas	215	213	278	232	153				
Florida	134	137	178	125	110				
Georgia	127	110	170	180	181				
Kentucky									
Louisiana	144	215	222	217	130				
Maryland									
Mississippi	176	181	188	210	177				
North Carolina	177	170	182	208	213				
Oklahoma			231	210	147				
South Carolina	170	174	177	194	210				
Tennessee	189	167	173	192	178				
Texas	221	187	188	170	125				
Virginia	177	155	170	197	190				
West Virginia									

[1] December, 1915, Crop Report.

eld per acre in bushels, and 10-year averages, for 15 Southern States.

	10-year average.				Calendar year—						
	1870-1879	1880-1889	1890-1899	1900-1909	1909	1910	1911	1912	1913	1914	1915[1]
.....	13.9	12.6	12.8	13.5	11.9	18.0	18.0	17.2	17.3	17.0	17.0
.....	24.4	19.8	18.2	18.7	14.8	24.0	20.8	20.4	19.0	17.5	23.0
.....	13.2	9.6	9.7	10.2	11.6	13.0	14.6	13.0	15.0	16.0	15.0
.....	11.2	10.4	11.1	11.5	11.6	14.5	16.0	13.8	15.5	14.0	15.0
.....	29.7	23.8	25.7	26.7	21.3	29.0	26.0	30.4	23.5	25.0	30.0
.....	17.2	16.0	16.3	17.5	16.4	23.6	18.5	18.0	22.0	19.3	20.5
.....	25.2	21.2	27.0	32.9	27.7	33.5	36.5	30.5	33.0	37.0	35.0
.....	15.4	11.3	15.0	15.2	13.1	20.5	19.0	18.3	20.0	18.5	19.0
ina...	14.7	12.2	13.0	14.8	13.8	18.6	18.4	18.2	19.5	20.3	21.0
.....				21.2	15.9	16.0	6.5	18.7	11.0	12.5	29.5
ina...	9.4	9.4	9.9	11.6	13.3	18.5	18.2	17.9	19.5	18.5	16.5
.....	21.2	21.5	22.0	23.0	21.5	25.9	26.8	20.5	23.5	24.0	27.0
.....	21.7	18.1	19.0	19.0	14.7	20.6	9.5	21.0	24.0	19.5	23.5
.....	23.1	16.8	19.1	22.7	21.6	25.5	24.0	24.0	26.0	23.5	28.5
ina....	28.3	23.4	24.4	27.5	25.3	26.0	25.7	33.8	31.0	31.0	31.5

[1] December, 1915, "Crop Report."

ield per acre in bushels, and 10-year averages, for 15 Southern States.

	10-year average.				Calendar year—						
	1870-1879	1880-1889	1890-1899	1900-1909	1909	1910	1911	1912	1913	1914	1915[1]
.....	14.2	10.7	13.1	15.6	16.5	18.5	19.2	20.0	20.5	22.0	19.0
.....	23.3	16.7	18.4	20.0	22.8	27.5	20.0	19.9	26.5	24.0	27.0
.....	13.4	10.2	11.1	13.5	17.0	16.2	13.5	17.2	18.0	18.0	20.0
.....	12.9	9.8	12.5	15.3	19.0	18.2	21.5	20.8	22.0	20.0	19.5
.....	22.2	18.2	19.4	20.9	22.3	25.0	18.4	26.9	19.8	21.0	26.0
.....	16.8	12.7	15.4	16.9	20.0	21.5	21.0	20.8	22.0	23.0	25.0
.....	19.8	20.1	20.9	25.1	25.4	30.0	27.0	30.0	28.0	27.0	34.0
.....	15.0	11.2	13.5	16.7	16.0	19.2	18.4	17.4	20.0	23.0	21.5
ina...	14.4	9.5	12.0	14.8	16.5	18.2	16.5	18.6	19.5	17.5	23.0
.....				29.4	29.0	36.5	9.0	25.1	18.0	27.5	27.0
ina....	12.0	10.5	12.6	17.1	21.0	21.0	20.4	21.5	23.5	20.0	19.0
.....	18.4	13.6	15.2	19.4	20.0	23.0	19.5	21.7	21.0	23.0	24.5
.....	28.7	23.8	24.4	27.8	18.7	35.0	25.1	36.0	32.5	25.0	35.5
.....	15.1	11.8	14.0	17.6	19.0	22.0	20.0	22.2	21.5	15.5	25.0
ia....	23.6	17.7	20.7	22.1	22.0	25.2	22.0	28.0	24.0	20.0	29.0

[1] December, 1915, "Crop Report."

yield per acre in bushels, and 10-year averages, for 15 Southern States.

	10-year average.				Calendar year—						
	1870-1879	1880-1889	1890-1899	1900-1909	1909	1910	1911	1912	1913	1914	1915[1]
.....	7.8	6.0	8.1	9.6	10.5	12.0	11.5	10.6	11.7	13.0	12.0
.....	9.4	7.5	8.9	9.5	11.4	13.9	10.5	10.0	13.0	13.0	12.5
.....	7.5	6.0	7.3	8.3	10.0	10.5	12.0	9.3	12.2	12.1	11.0
.....	10.4	9.4	11.6	11.5	11.8	12.8	12.7	10.0	13.6	16.5	11.0
.....	11.7	12.2	15.1	16.0	14.5	17.4	15.5	15.0	13.3	21.5	16.1
.....	9.0	5.6	8.5	10.0	11.0	14.0	12.0	12.0	14.0	13.0	20.0
na...	7.4	6.0	7.0	8.2	9.5	11.4	10.6	8.9	11.7	12.0	10.9
.....			13.8	12.8	12.8	16.3	8.0	12.8	10.0	19.0	11.6
na...	6.9	5.7	6.7	8.1	10.0	11.0	11.4	9.2	12.3	11.5	10.8
.....	7.8	6.6	9.4	9.6	10.4	11.7	11.5	10.5	12.0	15.5	10.5
.....	13.8	10.1	11.6	10.8	9.1	15.0	9.4	15.0	17.5	13.0	15.5
.....	8.5	8.0	9.9	10.6	11.2	12.8	12.0	11.6	13.6	14.5	13.8
ia....	10.7	10.0	11.0	11.2	13.0	12.5	11.5	14.5	13.0	15.0	15.0

[1] December, 1915, Crop Report.

Hay—yield per acre in tons, and 10-year averages

States.	10-year average.						
	1870	1879	1880–1889	1890–1899	1900–1909	1909	
Alabama		1.32	1.22	1.60	1.73	1.50	
Arkansas		1.39	1.24	1.27	1.50	1.25	
Florida			1.07	1.38	1.38	1.08	
Georgia		1.37	1.24	1.39	1.56	1.35	
Kentucky		1.25	1.17	1.26	1.38	1.36	
Louisiana		1.61	1.24	1.74	1.89	1.57	
Maryland		1.11	1.09	1.12	1.27	1.20	
Mississippi		1.41	1.26	1.56	1.65	1.47	
North Carolina		1.25	1.16	1.41	1.54	1.35	
Oklahoma					1.10	.90	
South Carolina		1.05	1.12	1.40	1.58	1.23	
Tennessee		1.33	1.22	1.31	1.52	1.30	
Texas		1.32	1.25	1.25	1.57	.95	
Virginia		1.18	1.11	1.09	1.27	1.30	
West Virginia		1.14	1.03	1.16	1.36	1.25	

[1] December, 1915, Crop Report.

Mr. HOWELL. Do you think the production will continue to increase and prices become n

Mr. KNARR. I think it will increase, Mr. H that the South will produce cereals in com and Northwest in the general markets of t competition with them for their own marke market is filled I believe that the South w of cereals, and I will tell you why. Our l covered with snow as are your lands. The the lands, and we find that a cover crop save not harvest the crop you can plow it un richness of the soil.

Mr. HOWELL. I believe your idea was to l tion of agricultural products in the South. part of that increase was accounted for by year.

Mr. KNARR. That may have had somethi think when we get through with this presen that there is no great falling back—that we this increased acreage in other crops.

Mr. SELLS. I think we have had this all d this witness is here to tell you his reasons f in the crops. I understand that certain sec out particular crops of cotton to raise in orde Now, we have had that up. As I underst of Agriculture is carrying out the scientific farms, regardless of how many bales of cott or will be raised next year, and telling the that is given to them through this scientific this witness should tell us just what he is d I believe that is what his function is.

The CHAIRMAN. As a matter of fact, thi this item is very unfortunate, and, as far as it was kicked into the middle of the Atlan trying to do that for a number of years. W

the South is trying to teach the farmers better agricultural thods, just as Mr. Smith is doing that in the North and East and st, and this word "boll weevil" is a very misleading word. Of rse, farming under boll-weevil conditions is different from farm- under conditions which are nonboll weevil, and for that reason boll weevil has its place in this document, but otherwise you ght as well set it afire and burn it up.

Mr. KNAPP. We are the force that fights the boll weevil through- the South, and if you will bring the farmers here you will find t that is the fact.

The CHAIRMAN. Your method has been to teach the farmer to do rming better—to farm under better conditions?

Mr. KNAPP. Yes, sir; with better practices.

The CHAIRMAN. And which would be good practices in any part the South?

Mr. KNAPP. Yes, sir; except for certain particular things they ve to do in connection with the boll weevil at certain periods.

Mr. MCLAUGHLIN. My question was not asked for the purpose of ving Mr. Knapp discuss the cotton situation, except to tell us mething about the results of his work.

Mr. STEELE. The result of his work is that he is increasing the oduction.

The CHAIRMAN. Go ahead, Mr. Knapp, and discuss the remaining atures of your work. I think you have covered pretty fully what ou are doing under the county-agent proposition.

Mr. KNAPP. For results, Mr. Chairman, I would say that my rce has been so busy in the field that we have not gotten all their ports and have not had time to complete the tabulation of the re- orts for the past year, but I have a tabulation of some of the re- ults in 13 out of the 15 Southern States.

(The statement referred to follows:)

ome results of the extension work in the South for the calendar year 1915.

[Taken from the annual reports from 13 of the 15 Southern States.]

UMBER OF DEMONSTRATIONS, ACREAGE, AND YIELD OF CERTAIN CROPS UNDER IMPROVED METHODS IN 1915.

rop data under demonstration methods:

Number of demonstrations in cotton	19,237
Number of acres in cotton demonstrations	201,974
Average yield per acre in seed cotton on demonstrations (pounds)	1,134
Number of demonstrations in corn	55,689
Number of acres in corn demonstrations	446,004
Average yield per acre on demonstrations (bushels)	38.4
Number of demonstrations in tobacco	393
Number of acres in tobacco demonstrations	2,630
Average yield per acre on demonstrations (pounds)	800
Number of demonstrations in oats	7,646
Number of acres in oat demonstrations	114,011
Average yield per acre on demonstrations (bushels)	35.19
Number of demonstrations in wheat	7,144
Number of acres in wheat demonstrations	77,759
Average yield per acre on demonstrations (bushels)	22.13
Number of demonstrations in rye	438
Number of acres in rye demonstrations	3,829
Number of demonstrations in barley	65
Number of acres in barley demonstrations	525
Average yield per acre on demonstrations (bushels)	30

Hay, forage, and cover crops:
- Number of demonstrations in alfalfa
- Acreage in alfalfa demonstrations
- Number of demonstrations in red clover
- Acreage in red-clover demonstrations
- Number of demonstrations in bur clover
- Acreage in bur-clover demonstrations
- Number of demonstrations in crimson clover
- Acreage in crimson clover
- Number of demonstrations in sweet clover
- Acreage in sweet-clover demonstrations
- Number of demonstrations in vetch
- Acreage in vetch demonstrations
- Number of demonstrations in lespedeza
- Acreage in lespedeza demonstrations
- Total number of demonstrations in legumes
- Total acreage in legumes
- Number of demonstrations in rye
- Acreage in rye demonstrations
- Number of demonstrations in sudan grass
- Acreage in sudan-grass demonstrations
- Number of demonstrations in sorghum
- Acreage in sorghum demonstrations
- Number of demonstrations in timothy and mixed grasses
- Acreage in timothy and mixed-grass demonstrations
- Number of demonstrations in miscellaneous and mixed forage crops
- Acreage in miscellaneous and mixed forage crop demonstrations
- Total number of demonstrations in nonlegumes
- Total acreage in nonlegumes
- Total number of demonstrations of all hay, forage, and cover crops
- Total acreage of all hay, forage, and cover crops

Summer legumes:
- Number of demonstrations in cowpeas
- Acreage in cowpea demonstrations
- Number of demonstrations in soy beans
- Acreage in soy-bean demonstrations
- Number of demonstrations in peanuts
- Acreage in peanut demonstrations
- Number of demonstrations in velvet beans
- Acreage in velvet-bean demonstrations
- Number of demonstrations, miscellaneous
- Acreage in miscellaneous demonstrations
- Total number of demonstrations in summer legumes
- Total acreage in summer legumes

Potatoes:
- Number of demonstrations in Irish potatoes
- Acreage in Irish-potato demonstrations
- Number of demonstrations in sweet potatoes
- Acreage in sweet-potato demonstrations
- Total number of demonstrations in potatoes
- Total acreage in potatoes

Orchards:
- Number of demonstrations
- Total number of trees in demonstrations
- Number of orchards inspected, pruned, sprayed, wormed, and planted due to demonstration influence
- Number of trees therein

LIVE STOCK.

es and mares		
r cattle		
o	[1]	
Cattle		
o		
o		
and goats	1	
o	[2] 8,	
ry		1

[1] Feeding. [2] Grades. [3] Herds started.

LIVE-STOCK DISEASES AND PESTS.

mers have been induced to treat for diseases and pests:	
Cattle	1,023,908
Hogs (for cholera 404,197)	682,182
Sheep	5,135
Horses	17,952
Total	1,729,177
ious kinds of live stock actually treated by agents (including 49,816 hogs treated for cholera)	308,963

M AND FARMSTEAD IMPROVEMENTS—THINGS DONE WITH AGENTS' ASSISTANCE AND ADVICE.

ldings erected	3,632
m buildings improved	5,456
building plans furnished	1,294
ne water systems installed or improved	1,092
ne lighting systems installed	748
ne grounds improved	7,158
n and home sanitary conditions improved	13,352
nes screened against flies and mosquitoes	18,248
traps installed	11,616
itary privies erected	3,579
phone systems installed	1,544
pastures established	6,188
pastures renovated	5,621
Acreage	105,791
h acres drained by tile	21,719
h acres drained by ditch	199,877
mers induced to remove stumps	6,657
Acreage	71,819
mers induced to terrace their sloping lands	7,335
Acreage	202,706
ne gardens planted or improved	29,319
mers induced to save surplus products for winter use	27,887
d-improving demonstrations assisted in	50,784
es in cover crops	265,177
w implements and tools bought	64,079

MISCELLANEOUS RESULTS.

ping vats built	1,759
s built	4,584
mers instructed in care of manure	29,007

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canning-club work in the 15 Southern States for the calendar year 1915.

ounties organized	308
irls enrolled	32,613
irls reporting	14,810
r of pounds of tomatoes reported	5,023,305
r of containers of tomatoes reported	903,562
r of containers of other vegetables and fruits	1,202,953
r of containers	2,106,515
r of meetings held	10,784
ance at meetings	400,283
r of winter gardens (five States reporting)	923
ment in poultry clubs	9,854
ment in bread clubs	3,062
fit per 0.1 acre	$24.01

home-demonstration work in the 15 Southern States for the calendar year 1915.

romen enrolled	6,871
emonstrations held	3,379
ance at meetings	74,335
ural community clubs	250
devices and home conveniences made by the women dem-	
cookers	2,181
efrigerators	599
rays	101
s	1,423
screened	661
aterworks	124
closets	138

s to the above devices, there were made floor mops, dustless mops, ds, scrubbing chariots, different cleaning devices, etc.

is the first year in which any definite home-demonstration work e among the women, the reports of this work are necessarily incom- ver, the State agents were urged to report this phase of the work as possible, and all the work reported has been included in these fluch of the work done in poultry raising, cooking, home dairying, h a nature that it can not be easily incorporated in the statistical

TYPES OF WORK BEING DONE IN THE POULTRY ORGANIZATION.

ns there are 25 demonstrators carrying on poultry demonstrations ed birds and shipping the products. One egg-shipping association nstrators shipped 60 dozen eggs a week.

ght seven counties have "cooperative egg-selling associations." ceived from sale of eggs by two cooperative egg-selling associations

ined by the two clubs selling cooperatively, $330.

mber of chickens per member, 27.

Jefferson County raised and sold chickens to the value of $69; in Harrison County sold 120 dozen of eggs.

Tex., they have nine egg circles; 4,570 dozen eggs sold since May, than 30 cents and some at 50 cents per dozen.

ns 85 girls making reports in poultry-club work had a total of their flocks raised 1,719 chickens and produced a total of 18,086 sold eggs to the value of $1,673.08. The average profit per member at $27.11.

s have 670 members enrolled in the poultry-club work in 70 report from one demonstration from 50 hens cleared $105.77.

GEN. These are results secured as a result of following associations with the ways you suggest doing the thing."

Mr. HERGESEN. In the same year?

Mr. KNAPP. Yes, sir.

The CHAIRMAN. Now, tell us how you d
demonstration a pretty progressive farmer, let u
plant 1 acre of land under your directio
not use the fertilizer that you direct, ap
him, and plow the crop when you tell hin
go ahead and handle that in that way, an
or let him use his ordinary methods i
harvesting his crop. Is that the way you

Mr. KNAPP. Yes, sir.

Mr. HERGESEN. What I am anxious to
about up to use in the yield do you do
a profit?

r. KNAPP. Oh, yes.
ıe CHAIRMAN. Tell us about that.
r. KNAPP. These demonstrations last year reached about 107,000
ıers. In addition to that, other farmers living in the vicinity of
tically all the demonstrations were reached, because the neigh-
got interested in the farmer who was working out this particular
That has led to what we call a field meeting for the instruction
ıe neighborhood. Sometimes the neighborhood arranges with the
ıty agent to have a demonstration for the whole community. As
y, we have not all the records tabulated, but we will have them
ently and have them in such shape that you can have these com-
sons of what we have done.
[r. HAUGEN. The chairman suggested that you take up one farm
give in detail your demonstration work on that one farm.
[r. HELGESEN. In how many counties are you working?
[r. KNAPP. Six hundred and ninety-five counties, according to the
records I have here.
he CHAIRMAN. Now, to answer Mr. Haugen's question, let us take
ırmer down in Lexington County, S. C. You have never seen
, but you go down there through your agent, talk to him, and
him what he is to do. Is that right?
[r. KNAPP. The county agent goes to this man and, if he can per-
le him to become interested in growing better corn and in doing
ore economically, he says, "How many acres will you take?" He
; he will take one or five, or whatever it is. Now, he says, "On
land I want you to follow the directions I shall give you. We
put our heads together to discover what is the best way to handle
r crop. You follow your own plan as to the rest of the farm."
preparation of the land is gone into, and the county agent tells
the best accepted practice for the planting of that corn. He
him what variety of corn he would like to have him plant and
s him get a variety adapted to that particular soil and climate.
gives him instructions about planting and the method of culti-
on of the crop. In the fall the seed is selected for the next crop.
shows him the method of seed selection. That corn is harvested,
sured, weighed; they get the average of that and the average of
near-by corn, and the farmer makes a report to this county agent
rding that. Throughout the season the county agent visits him
ıch times as it is necessary to give him instructions. He may not
ıere when the cultivation is taking place, but comes around prac-
ly once in every three or four weeks to see how the thing is
g on. When he comes there he often invites the farmers around
ıt and tells them that he is doing so and so and discusses with
ı the methods that have been employed on that plat.
he CHAIRMAN. You frequently go further and assist them during
winter in suggesting cover crops for the land, do you not?
r. KNAPP. Not only that, but we assist them in the planting of
mes, which is very important, as they can (except perhaps in
the semiarid lands in the Southwest), as one member of the com-
ee suggested, be hogged down or turned under to improve the

r. HAUGEN. Is any account kept of the expenses incurred?
r. KNAPP. Yes, sir.

Mr. HAUGEN. Have you a report on that?

Mr. KNAPP. I have no specific report, but I in the record.

Mr. HAUGEN. What is the figure as to the r

Mr. KNAPP. I will be glad to give that.

Mr. HAUGEN. Can you give us any idea of ing into consideration additional expenses?

Mr. KNAPP. I have some of the boys' figur the record.

(The statement referred to follows:)

EXAMPLES OF PROFITS SECURED BY FARMERS AS METHODS RECOMMENDED BY EXTENSION COUNT

CORN (VIRGINIA).

"Mr. Hugh D. Crigler, of Culpeper, Va. (Culpeper yield of any of the corn demonstrators. He prod on 5 acres of land, or an average of a little ov 5 acres. Several of the demonstrators made 75 t from 5 to 10 acres. Mr. Crigler made his corn at per bushel, making a net profit of $404.88 on the fiv from report of Virginia agent for 1914.)

Important items of production, as taken from C of this Crigler demonstration, is as follows:

Land broken April 20.

Eighty pounds of fish scrap, 200 pounds of 16 p 20 pounds of muriate of potash per acre.

"Farmers' interest" seed planted in May about

Rows 3½ feet apart.

Plants 12 inches apart in drill; one stalk in hill.

Harrowed twice; cultivated three times with tri

On this farm another 5 acres, with the same cul commercial fertilizers, made an average of 110 b words, these 20 acres, grown under demonstratio bushels per acre.

CORN (TEXAS).

"Mr. J. O. Pennington, of Brenham, one of M stated that his corn under demonstration methods, bushels per acre at a cost of $17.50 per acre, inclu On adjoining land that was not prepared like t under ordinary methods, made 15 bushels per acre was worth about $25 per acre to him on his den the old methods he had been using." (Extract fro

CULTIVATION (TEXAS).

"The following is a report of L. B. Taylor of acres under demonstration methods and 6½ worked field was broken the same in November and harro February and planted same time. Below will show

"Demonstration plat after corn was up: Har., bar., har.

"Ordinary plat after corn was up: Har., har., pl.,

"Demonstration plat yield, 67 per cent stand in pounds per acre.

"Ordinary plat yield, 100 per cent stand in n bushels per acre.

"All this field is light worn-out land, and the the lightest. Mr. Taylor says the late work with h any work on the farm, and that he expects to farm from agent's report.)

Mr. HOWELL. Do your instructions invariably produce better re-
ts than the farmers would achieve by following their own judg-
nts?

Mr. KNAPP. I should say that nine out of ten do. There may be
es where the farmer will do the wrong thing. For example, I
ve known of instances where the farmer followed out the agent's
tructions in the different stages, but in the last stage—in the culti-
ion—he thought his old method was the only thing, and took a
ning plow and went in there and laid it by as he was used to
ng.

The CHAIRMAN. And killed the crop?

Mr. KNAPP. Yes, sir; or practically killed it. We have often had
t happen, but that is just as good a lesson as if he had a splended
ld. For example, in boys' club work we have found most ex-
ent results.

Mr. HAUGEN. Can you give the average cost in other places?

Mr. KNAPP. Yes, sir. For instance, in Florida the average cost
corn in the boys' club work is 48 cents per bushel with a produc-
a of 37.55 bushels. In Kentucky the average yield was 67.8
hels, and the average cost per bushel 30.7 cents.

Mr. HAUGEN. My recollection is that some years ago where they
l a large yield the average cost per bushel was much greater than
ere the average yield was lower.

Mr. KNAPP. No, sir; that would not be true. It might be true up
a certain point.

Mr. HAUGEN. But everything has to be taken into consideration—
expense of fertilizer, etc.

Mr. KNAPP. Yes, sir.

Mr. HAUGEN. Everything is taken into account.

The CHAIRMAN. I had a letter yesterday from one of the agents
South Carolina telling me of the work of the champion boy corn
wer in the State for the past summer, and my recollection is that
reased 163 bushels per acre at a cost of 9 cents per bushel. Is
t so?

Mr. KNAPP. I have not the records.

Mr. HAUGEN. I believe the average cost was 43 cents a bushel.

Mr. STEELE. I wish you would figure out how you can raise 226
hels to the acre. Do you know how many hills there are in an
e?

Mr. KNAPP. That depends on how far apart they are.

Mr. STEELE. Now, that is just like most of you; you evade a direct
stion. Now, you ought to know that a hill is so large. How
ny hills do you have in the South to an acre?

Mr. KNAPP. In the case of Jerry Moore, the boy to whom Mr.
ugen referred, they were planted 3 feet 6 inches apart, and the
lks stood 6 inches apart in the row.

Mr. STEELE. How many stalks were there to the acre?

Mr. KNAPP. I do not remember the figures offhand.

Mr. STEELE. How many ounces did these ears average in weight
acre?

Mr. KNAPP. I do not know.

Mr. STEELE. It is impossible to raise 226 bushels of corn per acre
the average corn-growing country.

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[illegible]

Mr. K[illegible]

[illegible]

[illegible]

Mr. KNAPP. Yes, sir; I know there have been yields claimed that ve been cut out and never recognized.

Mr. MCLAUGHLIN. Would your method of checking up, so as to ow the facts as to whether the yield for which the boy is given edit is exactly as reported—show whether that is so?

Mr. KNAPP. The rule is that there must be two disinterested wit-esses as to the harvesting of the crop; and they must weigh the corn, ell three separate bushels and weigh that, and estimate from the eight of shelled corn as to the number of bushels in the total weight f the corn. That is certified to and even sworn to by these witnesses. ery often these witnesses include the county superintendent of chools, who is connected with the organization of boys' corn clubs as n the North.

The CHAIRMAN. All right, Doctor, go ahead with your statement. uppose you tell us a little about the boys' club work.

Mr. KNAPP. In the boys' work we have the same type of organiza-ion as in the other territory. They work through the schools, and he county agent gives the agricultural instruction in the county. The schools furnish the organization through which the enrollment s generally obtained. There are two men in my office, one of whom devotes all his time to the work of the boys' clubs and the other a part of his time. In every State, in cooperation with the agricul-tural college, there is a man who works on this problem, just as they do in the Northern States. We have an enrollment that runs in boys' and girls' clubs together 113,000.

We have not as many boys as formerly, because we found it is easy to get a large enrollment, but they do not all go through and do good work. We have been trying to restrict the enrollment, and the figures we give you now represent the number actually doing something and not just the number enrolled. We give the figures of those actually carrying out the instructions and raising crops. So we had in the corn clubs this last year, with a reduced enrollment, 41,000. In the canning clubs, among the girls, we had 47,625. In pig clubs we had 12,674; poultry clubs, 9,854; cotton clubs, 1,308; potato clubs, 943; bread-making clubs for the girls, 3,062; making a grand total of 113,463 in the boys' and girls' clubs.

Mr. HAUGEN. What inducement is held out to them?

Mr. KNAPP. Public-spirited people offer prizes, which are given through the schools for competition. In many cases the competition is for prizes in the shape of scholarships in the agricultural colleges.

Mr. HAUGEN. Are the winners given trips to Washington?

Mr. KNAPP. No, sir.

The CHAIRMAN. This boy, Jerry Moore, has a scholarship and is attending school now. I have seen him recently.

Mr. OVERMYER. There was some talk about discontinuing the giv-ing of prizes.

The CHAIRMAN. Is there anything else, Mr. Knapp?

Mr. KNAPP. Now, as to the women's work and the home-demon-stration work, that is a new development. In 1910 we undertook work for women and girls. They have at the present time 350 women county agents in these various States. These are all in coop-eration, the same as the men county agents. They deal with the problems of the home and home life, just as the county agent deals

with problems of the farm and farm econo
teaching of home gardening, the canning
from the gardens, and those that would oth
place, and teaching and demonstrations of
the home home-made affairs—leading to
greater economy in the home life itself. I
this has had about as great effect upon the
as has the county-agent movement itself.

The CHAIRMAN. It will have a greater e

Mr. KNAPP. I am sure it will. To-day th
approximately 35,000 homes. It has never
South to can vegetables and fruits for w
agents to handle that problem, and that is a
tion to the living of the families.

Mr. OVERMYER. I take it that the younge
take to these things more readily than the el

Mr. KNAPP. Yes, sir.

Mr. OVERMYER. And the results will be n
15 years than formerly or now?

Mr. KNAPP. Yes, sir; and just for the girl
of $104,000 in North Carolina.

Mr. MCLAUGHLIN. What was that?

Mr. KNAPP. $104,000 was the value of the
record of, put up by the girls in North Caro
are slow in getting the records together bec
to tabulate the figures.

There is another piece of work in which
whole trouble in getting a safe and self-s
the South is not only a farm problem, but it
lem. I mean by that that sometimes our
the tenant farmers, have been compelled to
the merchant or banker insisted on cotton a
We have taken up a very extensive work to
to get him into contact with the merchants a
so that credit will be extended on the basis
a man supporting himself on his own farm
as he possibly can toward his own living.
a great deal in the South about cotton bein
not been a money crop, and that has been t
that the men raise to mortgage or pledge f

The CHAIRMAN. That statement is true, e
or pledges it before he raises it.

Mr. KNAPP. Yes, sir; that is the reason
cotton instead of something else. Now, we
who had been reached by this demonstratio
been convinced of the value of diversificat
minds to get straight at the source of the
those who extend the credit, and by general
vincing the bankers and the credit merchan
we have had considerable success—more tha
started in getting them to change their bas
on the basis of the farmer pursuing a good
be very much better under that plan. The

feel that this is the real problem of poor agriculture and poor
it.
r. HAUGEN. Heretofore there has been no market for grain and
. The merchant, of course, will not lend money on grain that
ot marketable.
r. KNAPP. Yes, sir; the South was a market for northern oats
corn and is yet to a certain extent. There was plenty of market
e. We must teach them to buy home-grown grains. The judi-
s production of enough oats and corn and hay to supply the
n in question, with a little excess to put onto the market to furnish
nearby towns, is a source of credit and value to that farm. He
s not have to buy the feed for his mules and cattle as he would
e raised all cotton. Under the old plan the farmer has had to
oats and corn from the credit man, who bought it at some dis-
e, in order to raise the cotton.
r. HELGESEN. Do you think the South will ever be in a position
aise enough wheat by itself to take care of its consumption?
r. KNAPP. Very largely, I think it will.
r. HELGESEN. From what I have read about the matter, I was
dering whether the South had the soil and climatic conditions
nable it to raise wheat cheaper than it could buy it or in compe-
n with the other parts of the country.
r. KNAPP. In a great deal of the country, I should say yes. For
nple, before the war Virginia, North Carolina, South Carolina,
hern Georgia, Tennessee, northern Alabama, Mississippi, and
s of Arkansas were considerable wheat-producing sections.
r. HELGESEN. It is not necessarily that they may be able to raise
at, but can they raise other crops that will be so profitable that
can better afford to buy the flour?
r. KNAPP. That is a matter of soil fertility. If they have a
er rotation of the crops and build up the necessary soil fer-
y to produce a sufficient amount per acre to make it profitable,
but, if they can not, the answer is no. At the same time I want to
t out that we need some of those crops for the covering of the
in the winter.
r. LEE. What is the total number of men you have employed?
r. KNAPP. The total number of county agents is 695 and the total
ber of people employed is 1,405. Some of the people on that
k we do not call county agents. We have some work for negroes,
the negro agent is not called a county agent.
r. HELGESEN. You say the men who work among the negroes are
called county agents. Do you mean that the county agents will
do any work with the negroes there?
r. KNAPP. No, sir; I mean that we employ certain negroes in
demonstration work. There are 50 negro agents working in
o sections—where the prevailing population is negro. They
k only with the negroes. We do not call them county agents.
r. HELGESEN. Do not the county agents work among the negroes?
r. KNAPP. They work with the negroes as well as the white
le. I do not know of any cases where that is not true. I have
lefinite record on this subject, but my judgment is that at least
per cent of the work of the county agents directly benefits
oes. In many cases it is more than that, because when the county

agent goes on the plantation the negro gets the benefit, although the white landlord is the man shown on our record as getting the benefit of the instructions.

Dr. TRUE. I wish the members of the committee might have been with me a few weeks ago at Hampton, Va., where the extension agents working among the negroes had brought negro people together from all over Virginia—men, women, and children—who have been growing important products under their instruction, and the women canning fruits and vegetables and making various home articles. They had all those things brought together in a large tent and in a large hall, and it was a very interesting exhibit of good products and good sensible garments which the women had made themselves. It showed in that State (and I have no doubt similar things could be shown in other States) that there was real work going on as a result of this extension system among the negroes.

STATEMENT OF DR. A. C. TRUE, DIRECTOR OF THE STATES RELATIONS SERVICE—Continued.

The CHAIRMAN. Take up paragraph 28 and tell us briefly what you do under that item.

Dr. TRUE. Under our item 28 we have two divisions at work, one of which relates to the farmers' institutes. Very likely you know that the farmers'-institute movement in the United States has grown to be a very large one.

Mr. ANDERSON. I did not want to interrupt your statement, but this is a matter regarding which I wanted to ask a question for some time. Is the county agent taking the place of the old-style county institute to any extent?

Dr. TRUE. I am going to refer to that very briefly in my statement.

In 1914 there were held in this country 7,740 farmers' institutes with an aggregate attendance of 3,000,000. In about half the States these institutes are held under the general direction of the agricultural college. In 23 States they are managed by the State departments of agriculture. Now, when the extension system came into vogue and effect there was a distinct effort (which is still continuing) to fit the farmers' institute into the general scheme of the extension work in the State, and when the institutes are under the general direction of the agricultural colleges that is a comparatively easy matter. In the other States they are still managed separately, and in those 23 States in 1915 there were 4,000 institutes, with an attendance of 1,750,000 people. The institutes, as held in many of the States, cover the entire State, and thus they go into parts of the State which are not yet reached by the county agents. In order to help make these institutes more practical in character and to give through them definite information which the department has, we have carried on for a number of years this small division of farmers'-institute work. We get in touch with the directors of the farmers' institutes throughout the country. We find out the best method of work in the different States and publish articles which show the directors how they can improve their work. We also prepare special publications for use in the institutes, in which the results of the department's work and other work are incorporated in a definite and concise way. One special form of

publications is what we call syllabi of farm-institute lectures. of these contains a short outline of a lecture on some practical t, accompanied by about 50 lantern slides which illustrate the t, and these lectures and the lantern slides, as far as practicable. ade available for the farmers' institute lectures in different parts country.

w, these publications which we prepare for the institutes are also ble for use by the extension agents at meetings which they may with farmers in their respective counties. We do not propose crease of that work or in the appropriation.

e CHAIRMAN. Doctor, you may be able to answer this. This age says "upon similar organizations in foreign countries." that imply that you have the right under that language to send men to Europe, for instance, to study farmers' organizations or is that done through the literature of foreign countries?

. TRUE. We do not send any men to foreign countries. We r in the literature from foreign countries. Of course at the nt time, owing to the great disturbance on the other side of the we do not get as much information along that line as we rly did.

e CHAIRMAN. You are not apt to send anybody there?

. TRUE. No, sir; we do not.

. MCLAUGHLIN. I do not want to take up again the amount of se for administration, but in item 28, which provides $20,600 veral things, "to enable the Secretary of Agriculture to inves- and report," etc., on that manner of disseminating knowledge d as to improved methods of agricultural practices; does that ve some of the same work (it refers to improved methods of ultural practice) that is involved in the farm-demonstration farm-management work? Is some more money used in the nistration of that fund?

. TRUE. No, sir; not a cent is used in that way. Practical infor- n is given out through the publications to which I referred. is old language which the committee put in the item years ago as never been changed, but it has nothing to do with the work.

. MCLAUGHLIN. This says:

stigate and report upon the organization and progress of farmers' insti- and agricultural schools in the several States and Territories, and upon r organizations in foreign countries, with special suggestions of plans and ls for making such organizations more effective for the dissemination of sults on the work of the Department of Agriculture and the agricultural ment stations, and of improved methods of agricultural practice, including ployment of labor in the city of Washington and elsewhere, and all other ary expenses.

loes not say anything about publications there, Doctor.

TRUE. But we make the plans and methods for improvements institutes—suggestions for those through our publications.

CHAIRMAN. Is there anything further on that item? If not. up item 29. Doctor, was there any further statement you d to make?

TRUE. Under item 28 I have spoken of only one phase of the The other division is that which relates to our work regard- he agricultural schools. The teaching of agriculture in the ls of the country is rapidly extending. A great many States require the teaching of agriculture in the elementary public

schools and agriculture is taught in a
other secondary schools in this country
make that teaching as practical as we c
in touch with those who have charge of t
planning their course of study, so that i
book work but practical work at the sc
children, and we issue publications show
work can be carried out.

We have, I think, made considerabl
past year in getting the literature whic
school, in a more definite and practica
adapted to the use of the schools. We a
make the publications of the department
rural schools. You understand that in
the teachers are young women who, while
upon the farm, have had no special inst
teaching and especially methods of teac
ber of books which they can get is quite
all the time to make their instruction in t
textbook teaching. To get away from th
issue of the publications of the departm
school work we are now issuing and s
accompany the Farmers' Bulletins. In t
what material there is in the bulletins
schools. Out of that material practical
the students to do either at the school or a
tions, which are gotten out in the same
the other studies in the schools—arithme

Mr. RUBEY. To whom do you send the

Dr. EVANS. To our extension force, be
with the schools in the various counti
school authorities in the different State
ture in the high schools, etc.

Mr. RUBEY. The reason I asked that
lowed the practice in the last two or th
school teachers in my district. I have th
I have followed the practice of sending
of each year a number of Farmers' Bul
ment of Agriculture to assist them in
trouble is that I will use up my quota
short time, and I can not furnish them
like to.

Dr. EVANS. If in making your requests
Department of Agriculture, you will tak
I think you will find you can select certa
will be especially helpful to them.

Mr. RUBEY. I thank you for that infor

Mr. ANDERSON. You do not send an
young ladies'

Dr. EVANS. That is not our business.

Mr. MCLAUGHLIN. I was thinking th
the [illegible] and disseminate t
specialists sent there, why not the e

Dr. TRUE. The county agent is of great assistance in the schools, f he is a good man.

Mr. HOWELL. What assistance do you receive from the Bureau of Education in your work?

Dr. TRUE. We are entering into cooperation with the Bureau of Education so as to avoid duplication. For instance, we get a good leal of information regarding the progress of farm education in his country and other countries. We turn that information over to he Bureau of Education for use in the preparation of the sum-naries in their office. In another way we are cooperating with them y sending one of our men, under a cooperative agreement with that ureau, out into the various regions where we can get together a umber of men who are teaching agriculture in the secondary schools, nd discussing with them the courses of study, our special mission eing to enforce the idea that these courses should be made practical nd have definite relation to the agriculture in the region in which he school is located.

Mr. HELGESEN. I have received a great many letters from county uperintendents of schools and school-teachers direct for just the nformation that you are discussing, and I do not know where to et the information except by filling in the orders for Farmers' Bulletins. If I could tell them to write to you direct would they e favored?

Dr. TRUE. We would give them as much information as we could.

Mr. HELGESEN. Would it not be possible and perhaps better that he leaflets be bound in one volume? For instance, we get requests for half a dozen bulletins, and we have to use up half a dozen franks. Could not that be done?

Dr. TRUE. It could be, but it would be expensive. We are publish-ing, however, a little pamphlet suggesting to the teacher in the country schools how to make a collection and make a simple cata-logue, with card indexes, and thus have the bulletins available for use.

Mr. HELGESEN. But if 30 bulletins and the leaflets are requested you get that request, and half a dozen franks are used. It would be more convenient to have them put up in sets.

The CHAIRMAN. Is there anything further, gentlemen? I presume you have covered this item sufficiently. It is one of the old items in the bill. Gentlemen, it is now after 5 o'clock, and we have two more items.

Item 29 has to do with the work at stations in Porto Rico, Alaska, Guam, and Hawaii. You can either present it yourself or have the gentleman in charge do so.

Dr. TRUE. I think it will save time if Dr. Evans, who has charge of the insular stations, will present the matter.

STATEMENT OF DR. WALTER H. EVANS, CHIEF OF THE DIVISION OF INSULAR STATIONS, STATES RELATIONS SERVICE.

The CHAIRMAN. In your own way, Dr. Evans, tell us what you are doing under each of these headings.

Dr. EVANS. Do you want to review the work at the different insu-lar stations?

We have been carrying on this work for a little ... we have now succeeded in producing a number of w... lots of strawberries that are perfectly hardy not on... other places along the coast region of southern Al... These have been described in the annual reports f... and they are now being distributed to people throu... where they are suitable. They were produced by ... selection of the strawberry found growing in a ... of the southern islands with the native spec... the gravelly banks of the sea near Yakutat. It res... improvement ... fruits as far as size ... very ... over the introduced ... flavor.

In the case of other fruits we are working with a ... indigenous as well as some introduced ones. W... varieties of ... currants, gooseberries, ... are doing well established and distributed as rapidly ... hand that are found adapted to the country.

In the case of the larger fruits, we have had five ... ripen. That is practically the first time that five v... have ripened in Alaska. They were of the crab a... of apples ... good ... apple country, but f... apples ... where they are not shown ... it was quite a ... achievement. We have ... and plums ... The plums do not seem to d... have had ... some years, such as the Early ...

In the case of vegetables, work has been largely ... establishing varieties suitable for Alaskan conditio... vegetables, such as cabbages, cauliflower, turnips, e... getting a variety from Iceland which has prov...

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Rampart, which is the farthest north station, situated on the
ı River within 50 or 60 miles of the Arctic Circle, we have
a situation which is good for plant-breeding work. Our work
en carried on there for something like 12 years, in which time
fferent varieties of grain that grow in that country have been
lized, and we have now four established varieties of barley
were grown last year for extended distribution through the
ɔr region of Alaska. These were produced by crossing a
y of barley which was secured by the department some years
ɔm the Himalayan Mountains in Asia with a variety found
ng along a trail north of the Yukon River.
ddition to grains, we have gotten some of the hardier varieties
alfa, and they are growing and some are producing seed, par-
ly varieties brought over from Siberia by Mr. Hansen some
ago.
are also, at this particular station, growing peas for seed dis-
ion. This is the farthest north on this continent and prob-
s far north on any continent where peas are grown for seed
ses, and we have several hundred pounds grown there this past
which will be for local distribution.
Fairbanks our work is in the nature of general farming, trying
w that farming can be made a success on a considerable scale.
ve about 100 acres of cleared land, about 30 of which is under
ıtion. I have not yet received the annual report, as we do not
ry much communication from them at this time of the year, but
st report that I received showed that over 1,200 bushels of
of various kinds had been threshed out at Fairbanks for local
ution.
potato crop two years ago was over 1,600 bushels. I do not
what it is this year, but last year there was a combination of
ions which reduced the yield quite considerably—an excessive
ıt in the early season followed by heavy rains in the fall,
caused the potatoes not to ripen. Yet we have produced 1,600
s of potatoes on less than 4 acres of land, showing the possibi-
ɔf growing potatoes, and, while that is not anwyhere near the
, I think that it is a very high yield.
Kodiak, which is on an island, the work is with live stock.
the island was covered with the volcanic ash from the explo-
Mount Katmai in 1912 we have been interested very largely
ıttempt to revegetate our pastures, and we are succeeding bet-
ın we expected, and while it was necessary to take the stock
from the island because of the 14 inches of volcanic ash (they
aken away for two years), we are again carrying our stock
ally produced silage and hay. We have about 50 head of
—Galloways—and the only feed that they get is range during
nmer season and during the winter silage and hay made from
produced grasses or grain sown for the purpose.
. Georgeson, who is in charge of this work in Alaska, is very
ıs to undertake a cross between the Galloway, which is ex-
gly hardy in this locality, and the Holstein, which will give
ly beef animals but milk. The cows in Alaska, usually taken
he Puget Sound region, are generally of the Jersey type, and

they have not proved very successful, as the
cold winter rains and are generally unadap
The CHAIRMAN. That gives us a pretty
have four stations there now?
Dr. EVANS. We want to establish, Mr. C
along the line of the new railroad that is
to Fairbanks, which goes up the valley of
Susitna. It opens up a new region in Ala
of the most favorable agricultural regions
knowledge. This region is being settled r
steads being taken up during the past sum
course of construction, and the chairman
Commission assured me yesterday that
1st of June the rails would be laid as far
selected for our station. They are workin
doing the grading, etc.
Mr. HAUGEN. Is that work done by the G
Dr. EVANS. Yes, sir.
The CHAIRMAN. In your note here you
that heretofore you have been getting for t
$8,000 from the sale of products there, w
into the Treasury as miscellaneous funds,
tion is really decreased by $8,000.
Dr. EVANS. Yes, sir; from what it was la
including the balances, which we have h
our stations for maintenance, has been wit
now are deposited to the credit of misc
Treasury.
For the year ending June 30, 1915, the
was carried over was practically $8,000
fund practically reduces the appropriation
The CHAIRMAN. What act compels yo
miscellaneous fund?
Dr. EVANS. It was an act of Congress, I
on the floor of the House.
The CHAIRMAN. Yes; I recall it now.
of the House.
Dr. EVANS. We had had this privilege
this fund a very helpful source in preve
carried over that were hard to get in. F
to be made near the close of the fiscal yea
possible, in some instances, if the purcha
or Fairbanks from Seattle, to know what t
charges, etc.
The CHAIRMAN. Until last year you h
funds?
Dr. EVANS. Yes, sir.
The CHAIRMAN. I recall a point of ord
item carrying that language; it went out
and was not put back in the Senate.
Dr. EVANS. Yes, sir; and the same t
stations.
The CHAIRMAN. Now, I notice that it is
at new stations.
Dr. EVANS. Yes, sir.

Mr. HAUGEN. To what extent is agriculture carried on in Alaska?

Dr. EVANS. Around some of the larger towns there is quite a arge amount of agriculture, especially around Fairbanks. Around ll of the towns there is gardening to quite a considerable extent.

Mr. HAUGEN. Are they growing any wheat?

Dr. EVANS. We are growing wheat; yes, sir.

Mr. HAUGEN. I know you are growing it on the station, but anyhere else?

Dr. EVANS. A good many are growing barley and oats.

Mr. HAUGEN. In what amounts?

Dr. EVANS. Quite considerable.

The CHAIRMAN. Now, take up Hawaii.

Dr. EVANS. In Hawaii our attempt is to diversify the agriculture. Ve started in our station in 1901 with the policy of diversified agriulture and we have tried to keep to that ever since. Our investigaions, like those at every other experiment station, are carried along gricultural, horticultural, and other lines. The chemical work durng the past few years has been largely studies of the soil, soil surveys of the principal types of soil of the islands, and the proper use f fertilizer in connection with these soils. This work has been carried on for six years and has given some excellent results, particularly n connection with the study of biological factors of the soil and the ffect of certain chemical salts in the soil. It was found that in laces there is considerable manganese in the soil. When it is present is almost impossible to grow some particular crops, especially pineapples. In the diversification of crops in Hawaii they have taken up he growing of pineapples. Where the soil contains a great deal of anganese, if pineapples are grown the plants turn yellow and the uit is inferior usually. We found that this type of soil should be voided, and that where the soil puddles aeration through growing f leguminous or other crops or by other means is highly essential. his was disputed by the sugar producers, but within the last few ears they have adopted the plan of introducing leguminous crops n their cane fields. That has only been within the last three or four ears.

In agronomy we have made a forage survey of the islands and ublished a bulletin giving the results of the study of the forage lants on the cattle ranges. This bulletin was issued, I think, last une, giving the results not only with the grasses and other forage lants that have been introduced through the station and disseminated on the stock ranges but with the native plants as well.

Mr. HAUGEN. Are you giving any attention to the growing of obacco in Hawaii?

Dr. EVANS. Yes, sir. We took that up some years ago and found nder certain conditions that tobacco grew well, but the question of he selection and handling of the crop has not yet been fully worked ut, although there are a number of individuals who have undertaken it.

Mr. HAUGEN. Have they been successful?

Dr. EVANS. Some years they have been very successful and other ears, for some unknown reason, they have secured crops that obtained low prices.

Mr. HAUGEN. What is the best record?

Dr. EVANS. The best record is the g
and during one or two years they had
for some reasons not determined, their v
and, instead of bringing high prices, we
Mr. HAUGEN. How does it sell in thi
other tobacco at what price?
Dr. EVANS. I do not know the figure
has not been interested in this matter fo
growing was taken up by two or thre
their desire of our keeping out.
Another line of work has been with ri
considerably more rice than it produc
see if we can not do something to cha
an old native food. We are carrying o
why the yield of taro has diminished
carrying that on near Honolulu on an
taro production for some years.
Mr. SUTER. What is taro?
Dr. EVANS. Taro is a large bulbous
tent, with roots of approximately 4 c
perhaps a foot long. Usually the nati
to pat the boiled or roasted roots in a
them into a paste, which is slightly fern
Mr. HOWELL. Is that poi?
Dr. EVANS. Yes, sir.
The CHAIRMAN. Is it pretty good eat
Dr. EVANS. I can not say I was imp
is the growing of potatoes, corn, and l
of the islands where they can be grow
to have some of the smaller farmers t
on a small scale. The main trouble wi
is the marketing question. An individu
who has material to sell has got to get
the intersland steamboats are high, a
small consignment has to pay pretty n
consignment in freight. There has be
years a marketing division, maintained
which we get the people in the differ
operative associations to grow and sell
The surplus, if it will stand shipment t
and in quite a number of cases beans a
shipped, and very good prices have been
In the [illegible] are the work
bananas, and the propagation of tropi
of tropical fruits is rather very different.
the fruit trees there, as can be [illegible]
Special methods of budding and grafti
the pineapples we are endeavoring to
[illegible] and at the same time be
[illegible] disease as some now grown in
[illegible] a study of economic insec
One of the principal things we [illegible]
the extension service, for which the [illegible]

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was organized by putting it in charge of a man whom we think
ne of the most competent men in Hawaii. He was connected
our station for quite a number of years and is now living on his
farm on the island of Maui. He has brought the people to-
er into an organization by which they mutually assist each other,
irecting their work and they carrying out his instructions. Then,
ugh the marketing arrangement just described, their products
narketed as far as possible.

ne CHAIRMAN. Is that all, Doctor?

r. EVANS. In relation to this increase that is asked I might say
xplanation that there are four large islands in Hawaii, and the
nsion fund of $5,000 will not go far when you have to pay a fare
20 between each island. We have one man, the superintendent of
nsion work, and three collaborators, one in each of the islands,
we hope, if we can get enough money, to put a man on each
id who will be the same as the county agent, of whom we have
'd to-day.

he CHAIRMAN. How many islands are there?

r. EVANS. Five large inhabited islands.

r. OVERMYER. What is the total area?

r. EVANS. About 6,000 square miles.

he CHAIRMAN. You want $5,000 for the Hawaii experiment sta-
. Your note says:

this amount it is proposed to use $2,000 to offset a like amount hitherto
ed annually from the sale of products but now no longer available. The
ining $3,000 is desired for the purpose of undertaking needed experi-
al work with the forage crops at the suggestion of and in cooperation
the War Department. It is believed that this work would greatly stimu-
the production of suitable forage crops on the islands and would result
large saving to the War Department, at the same time making our Army
in Hawaii largely independent of the mainland for its forage.

r. EVANS. I was in Honolulu last June and while there took this
er up. It had been broached a number of times by the War
artment. I had a number of interviews with the officers in
ge, seeing Gen. Carter, who was in charge of the Department of
'aii, and Col. Cheatham and Capt. Fair, in charge of the barracks
de of Honolulu. They have at Schofield Barracks about 4,000
es and mules. Practically no hay is produced in Hawaii, and
y bit of forage for those 4,000 head of stock is brought from San
ıcisco. The freight from Honolulu to Schofield Barracks, 23
s, is about as much as from wherever it is secured on the main-
to San Francisco and from San Francisco to Honolulu, making
ost of hay about $50 a ton. Now, our investigations have shown
ıat there are a number of forage plants that can be grown there,
ve have never carried on any experiments along this particular

Schofield Barracks is a military reservation of 47,000 acres,
; in a broad valley. There is an area of about 11,000 acres not
for military purposes, and all these officers have assured me that,
e could show that it would be practicable to grow forage and
e hay or provide it in any way that it could be used for the stock,
e 11,000 acres lying in that valley could be used for that purpose;
Col. Cheatham estimated that they could effect a saving of more
a hundred thousand dollars annually if they could produce their
forage.

acterized by an exceedingly prolonged drought, cutting great many crops, but two introduced grasses, which were Guam after our station was established went through the season, furnishing practically the only grazing on our sta- ose were two tropical grasses, and they are being distributed y as we can do so; but, unfortunately, these grasses, like a ny other tropical grasses, do not seed abundantly, and the is to take up the sod.

ERMYER. What is the area of Guam?

ANS. 265 square miles.

ERMYER. What portion is arable land?

ANS. Various estimates have been made, but I think it ranges per cent.

UGEN. Your problem mainly is the growing of live stock, is ctor?

ANS. We are also undertaking corn improvements, and this ad a remarkably successful report of experiments in cotton the idea being to develop some crop in addition to the one opra, a product which is the only export crop which Guam sent down in December from the Hawaii station some of Egyptian cotton seed. They reached Guam in December be planted, and from one variety we got a yield of 1,641 er acre of seed cotton. The same variety planted six weeks gave 542 pounds, showing the value of getting in your crop eason. Of course, the later crop was injured by the pro- ought, of which I spoke a few minutes ago.

our principal experiments is that of stock raising. Some we sent to Guam some improved live stock—horses, pigs, chickens—and they are doing exceedingly well, although y we are having a great deal more trouble than we expected attle. When I visited Guam I was assured there was noth- the tick fever on the island. There were a few ticks, but veterinarians assured me there was nothing like the tick re. We sent down some cattle, and, while the net result an increase in the number of stock, still the loss from tick s rather discouraging. We have begun a campaign of tick n on our station grounds, following the methods used by au of Animal Industry, and we hope to clear up the place continue the cattle-breeding work without the severe losses ve occurred within the last few years. We think we are l. We have had a normal increase in the horses sent there, tallions have been gratuitously bred to many mares belong- tives. I might say we offer, as far as possible, gratuitous f the stallions in breeding to native mares. The cows and flourished and I think there is no question whatever but increase in the number and in the value of the cows, pigs, tens is very large. The natives have taken very kindly to er animals, although they do not seem to care very much rger ones.

carrying on a considerable distribution of seeds of various rticularly of vegetables. These are distributed with the ding that they shall be cultivated and not eaten—except se. We have arranged with the constabulary of the islands

to see that the seeds are properly planted an
results are coming from that, and the inc
stations that came from the natives for see
considerable more than double in the pas
in any previous year. Our distribution of se
to about 10,000 lots in this past season.

The CHAIRMAN. Is there anything further

Dr. EVANS. Nothing, except that the sa
case of Guam as in other stations—we lose
fund.

The CHAIRMAN. How much did it amount

Dr. EVANS. As we are doing practically ev
itously, it is only $250.

The CHAIRMAN. We are very much oblige

STATEMENT OF DR. C. F. LANGWORTHY, OF HOME ECONOMICS, STATES REL

The CHAIRMAN. We will next take up ite
I believe, has charge of that work.

Dr. LANGWORTHY. Mr. Chairman and gen
rearrangement of work in the Departmen
went into effect on July 1, the Office of Ho
tuted in the States Relations Service to stu
cluding investigations relative to food, c
equipment and management," to quote from
Secretary of Agriculture regarding the orga
The subjects enumerated are the principal s
of Home Economics. They are all concern
home of agricultural products for food, for
purposes, for, generally speaking, the home
culture for almost all the commodities used

Other members of the States Relations Se
of their reliance upon the Department of
cultural colleges, and the experiment statio
and facts which they take to the farmer by
work carried on under the Lever Act. Such
of information of value to the farmer are
respect to information of use to the farm wo
been less generally made and the fund of
not so great. Of that which is available, a
tributed by the Department of Agriculture.
work an abundance of trustworthy informat
be placed in the hands of the extension wo
and, accordingly, it has been the aim of the O
to so shape its work that it may provide th
home-economics work carried on under the
ample of the way in which this is done, I m
tions Service Document 16, Extension Nor
for the use of potatoes and homemade potato
pared at the request of the Office of Exten
and West and which includes data secured by
practical methods carefully standardized
Economics.

ır work has been carried on for the purpose of providing nformation about palatable and economical ways of using ıed fruits and vegetables prepared by the girls' canning \ more extended investigation is that which deals with home of canning meat and meat products, a project which is now rried on in cooperation with the Bureau of Animal Industry. ıce of the canning-club leaders, as well as the receipt of nu- letters by the department from farm women, make it clear re is great interest in this subject, and that the matter needs study in order that methods may be provided for the can- b work which are thoroughly trustworthy under exceptional ıs under ordinary conditions. Good progress is being made. example of other work, mention may be made of the studies sorghums (Kafir corn, feterita, and milo maize) and their food, which have demonstrated that these grains (which are ops in many regions where other grains do not flourish so e worth using for their nutritive value. These grains may ıred for the table in many palatable ways, but to be at their l special methods of cookery. Recipes for so preparing them ın worked out, standardized, and published.

inquiries are received from housekeepers regarding the nd uses of table and culinary fats, and so a series of studies ubject has been undertaken which is yielding very promising United States Department of Agriculture Bulletin No. 310 ional paper), "Digestibility of Some Animal Fats," recently d, reports some of this work. This, like other bulletins on r which we have material on hand), supplies data of use to ı teachers and other teachers. In addition, a farmers' bulle- rthcoming which gives the gist of the whole matter in such at the housekeeper will be able to profit by it.

rn from the work on food to that on the other subjects in- ı Office of Home Economics, attention has been given partic- ɔecause of an expressed desire by housekeepers for data on ect, to a study of problems relating to the removal of spots ns on household textiles and clothing—a question of much ɔ importance as well as convenience in the home. Stand- methods have been worked out for publication which will be ; use to the housekeeper in her efforts to keep the family and the household equipment in good condition and so pro- ir usefulness.

too, in the line of household equipment, information such as ısion worker in home economics needs has been collected and d which has a bearing on the location, arrangement, and ng of the farm kitchen and on the selection of utensils. the subjects considered with reference to the farm home in ıre: The finishing of walls, floors, and ceilings; lighting, ven- and heating the kitchen; the proper height of work tables, ıd so on; the arrangement of the household furniture; and ɔe of house furnishings for necessity, for convenience, and ort.

eed for lightening household tasks and for reducing the of the farm woman's labor is a problem in household man- whose importance is generally recognized. Before the de- d can be reached something more is needed than a knowl-

. The results obtained up to the present justify the confidence
ed in this new method for studying an old problem. Work like
carried on in these two projects has a bearing upon home prob-
s, since both have for their practical object the increase of the
lable food supply by increasing the output of these two agricul-
l products.
he respiration calorimeter is also profitably employed in coopera-
studies of problems pertaining to the changes which take place
n fruits and vegetables are handled and stored under home and
r conditions.
he work of the Office of Home Economics is of significance not
because of its results, some of which have been pointed out, but
because of the methods for work which have been devised. Some
ese are highly technical and others extremely simple. They are
efore useful not only for exact studies in the department, the
cultural colleges, and the experiment stations, but also for exten-
workers who often have an opportunity in the field to collect
of great value.
y close cooperation the Office of Home Economics passes on to
extension offices of the States Relations Service the data which
cumulates, and ways for doing this effectively are carefully con-
red by all concerned. Personal contact with the workers in the
erent States is an important matter in this connection, since in
y cases it is thus possible to impart the details of experimental
k and of methods more effectively than by correspondence or by
ns of the printed page. When resources permit, such personal
act could be assured under economical yet effective conditions at
s when the State leaders and other workers are in Washington
their regular conferences. We believe that the development of
a project for even more effective cooperation between the Office
Home Economics and the individual workers in the home-
omics extension movement would prove very helpful.
general, in the work of the Office of Home Economics, under-
n for the home, women and men are working together in about
l numbers. So far as resources permit, varied problems related
ome life are receiving consideration, preference, however, being
n to those of most use in the extension work carried on under
Lever Act and to those in which a rapidly growing correspond-
shows farm women to be specially interested.
e believe that it can be truthfully said that in this work (cou-
with that of the extension offices among rural women and girls)
en have in effect what they have often expressed a desire for—a
an's bureau—that is, an enterprise devoted to the study of home
lems as distinguished from those of the farm and so related that
esults are disseminated and demonstrated throughout the coun-
t the places where the women reside.
he CHAIRMAN. Gentlemen, the committee will stand in recess
to-morrow morning at 10 o'clock.
Thereupon, at 6 o'clock p. m., a recess was taken until Wednes-
February 9, at 10 o'clock a. m.)

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AFTER RECESS.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Thursday, February 3, 1916.

The CHAIRMAN. Turn to page 180 of the Book of Estimates, gentlemen, the Office of Public Roads and Rural Engineering. I understand that Dr. Page, the chief of this office, is ill, and Capt. Wilson, his assistant, will take charge of the hearing.

STATEMENT OF MR. P. ST. J. WILSON, ASSISTANT DIRECTOR OF THE OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

The CHAIRMAN. Under item No. 1 there is added $500 to the salary of the director. I presume that you would prefer that we ask the Secretary about that.

Mr. WILSON. Yes, sir; I think he should answer about that.

The CHAIRMAN. Take up item 2, then, one draftsman or clerk, in lieu of one draftsman, at $1,920. That is just a change of designation?

Mr. WILSON. Yes, sir; a change of designation only. We find that by having such positions as "draftsman" or "photographer" on the statutory roll the same opportunity for promotion that those in the position of clerk have is not afforded. We only have one or two draftsmen in the office, and it was our thought that, if we could change the designation of these draftsmen to "draftsmen or clerk," then, with this designation, when we have a vacancy in a clerkship of a higher grade it would be possible to promote one of the draftsmen. We have asked for a similar change in designation in the case of a photographer who has remained at $1,200 for five years; and if this change of title is allowed, when a vacancy occurs in a higher grade we can promote him.

The CHAIRMAN. Any questions? If not, take up item 4, one model maker, by transfer from lump fund for road management, $1,800.

Mr. WILSON. That is merely a transfer from the lump fund, without increase in salary, and the lump fund has been correspondingly reduced.

The CHAIRMAN. Just a transfer from the lump fund for road management?

Mr. WILSON. Yes, sir.

The CHAIRMAN. Item 6, five clerks, class 3, increase of one by transfer from lump fund for road management.

Mr. WILSON. That is the same thing; this clerk is transferred from the lump-fund roll and the latter roll has been reduced by the amount of his pay. All these transfers are made in that way.

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Mr. Wilson

essenger boy; we can dispense with a laborer in the winter, at a me when we need more messenger service, because of the fact that any of the field men are back in the office, and in summer the con- ition is reversed and we need more laborers.

The CHAIRMAN. Are these messenger or laborer places filled mostly y messenger boys?

Mr. WILSON. Mostly laborers.

The CHAIRMAN. All right. Item 37. You have a transfer there nd a change of designation. Same explanation?

Mr. WILSON. Yes, sir; the lump fund for road management has een reduced.

The CHAIRMAN. Item 39, seven laborers, messenger boys, or char- vomen, at $480 each, an increase of two, with change of title in each ase.

Mr. WILSON. Same explanation. We have had to put on more harwomen since the Office of Public Roads moved into the building n Fourteenth Street. The irrigation and drainage work was trans- erred to the Office of Public Roads and Rural Engineering from the States Relations Service, necessitating the rental of a larger build- ng. This made it necessary to put on more charwomen than we had efore. They have been carried up to this time on the lump fund for oad management, and this is the first chance we have had to put hem on the statutory roll.

The CHAIRMAN. No new places are asked there?

Mr. WILSON. No, sir; no new places on the statutory roll.

The CHAIRMAN. Page 184, gentlemen. Your general expense item, aptain, No. 42, "For inquiries in regard to systems of road manage- ent throughout the United States and for giving expert advice on his subject." I would like to have you state briefly what you do nder that item?

Mr. WILSON. Mr. Chairman, would it be permissible for me to ave Mr. Pennybacker, the chief of that division, explain that?

The CHAIRMAN. Certainly; we will hear Mr. Pennybacker on that. Vill you tell the committee, as briefly as you can, just what you do.

STATEMENT OF MR. J. E. PENNYBACKER, CHIEF OF ROAD ECONOMICS, OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

Mr. PENNYBACKER. Mr. Chairman, all of the statistical work in onnection with the collection of matter relating to road mileage, haracter of improvements, and amounts of expenditures in the arious States is conducted by the Division of Road Economics. The ivision also deals with legislative questions submitted to the office nd assists State legislatures and other State bodies with reference o any State legislation upon which they desire advice. For ex- mple, in the framing of laws relating to the State management of oad construction and maintenance, they frequently call on us to dvise them as to what other States are doing to meet similar prob- ems, and often go so far as to ask us to aid them in the actual draft- ng of legislation that will accomplish the purpose sought.

In addition to these projects we are making comparative studies of State highway departments so as to ascertain the character of their

SAMPLE

Mr. HAUGEN. You have reference to the cost to the State and nties?
Mr. PENNYBACKER. Yes, sir.
Mr. HAUGEN. And the utilization of convict labor?
Mr. PENNYBACKER. Yes, sir. We have collected from time to time general way information in regard to convict labor, and about ear and a half ago we made an arrangement with the Public lth Service under which they have detailed a surgeon to assist us. sent out an engineer, accompanied by this surgeon, to make a sonal inspection of the convict-labor camps on road work in dif- nt parts of the country. They were directed to inspect these ps and make a report on the systems of management, the dis- ine, the cost of operation, unit cost of the work, the structures nd to be most suitable, and, in fact, all details of operation. They e now completed that general study and are engaged in the prepa- on of a bulletin, which we hope to issue some time this spring, ing a comparison of these systems.
We have supplemented that study by an arrangement made with ton County, Ga., for the operation by the county commissioners demonstration camp, in which we shall put into practical effect various phases or features of convict management and operation t we deem most likely to produce success. In other words, the nonstration camp is a practical try out in one camp of the most uable features of all the camps and some features we devised our- es.
Mr. HELGESEN. At whose expense?
Mr. PENNYBACKER. At their expense, except that we are assigning an there and paying his salary and expenses to carefully observe operation. We also cooperate with the county to this extent, that are paying a certain compensation to the two county men, in er that they may ascertain certain facts and report to us. This ngement is essential, because the things which we are asking them lo are outside of their usual duties and such as the county would naturally require; at least, they would not desire the minute ort that we want for this particular project.
The CHAIRMAN. The object of this work being to devise the best hod of handling convicts on public roads?
Mr. PENNYBACKER. That is the purpose, sir.
Mr. HAUGEN. Is there much road work being done by convict or?
Mr. PENNYBACKER. Yes, sir. In Georgia alone they are using over 0 and in Virginia over 1,600 convicts. A number of the States taking up the question of turning their entire convict force, or nsiderable portion of it, to road work.
Mr. ANDERSON. Is that work done on State account or under con- t?
Mr. PENNYBACKER. That work is usually done on State account; in some cases the work is done by contract, the contractor allow- a fixed rate, say $1 a day, for each convict furnished for the k.
Mr. ANDERSON. Who gets the dollar; the State?
Mr. PENNYBACKER. The State or the county gets the benefit. For nple, if a contractor bids $5,000 and there are 2,000 convict days

involved in that contract, he is paid $2.000 in the form of this time of the convicts and $3.000 in money. They may have some different method of bookkeeping, but that is the practical outcome.

Mr. ANDERSON. I was wondering whether, in the use of convict labor, there was also growing up a system of paying the convicts for this work on their personal account?

Mr. PENNYBACKER. That is done in some cases and it is advocated strongly in other cases. Their payment in some cases is as high as 50 or 60 cents a day. It is paid directly to the convict or placed to his credit and turned over to him when he leaves.

Mr. HELGESEN. Will you in your report state which of those systems is the more desirable?

Mr. PENNYBACKER. Yes, sir: we shall cover in the forthcoming bulletin all of these points.

Mr. HELGESEN. From the humanitarian standpoint as well as from the financial standpoint?

Mr. PENNYBACKER. Yes: we shall try to deal with the humanitarian side incidentally. Of course, we are supposed to deal with it from the economic standpoint, but naturally we shall take into consideration every phase of the system, so far as it seems desirable.

The CHAIRMAN. Take up your next subject, the economic study of highway systems in selected counties, the proposed expenditure for 1915–1916 being $550.

Mr. PENNYBACKER. That is a small item. We selected a small number of counties, eight in all, in which to make a comparative study from year to year in order to ascertain just what would be the financial burdens and the economic benefits to the counties. We selected counties that had no improved roads at all: we made our study just prior to the inauguration of the road-improvement program, and then carried it through year after year for a period of five years so that we would have exact data to show what would be the benefit to those counties because of that road improvement. We have completed that five years' study and the bulletin is now just about ready for the printer: we hope to send it to the printer in about 10 days.

The CHAIRMAN. Take up your next one, the economic study of selected post roads.

Mr. PENNYBACKER. In connection with the appropriation of $500,000 made in the post-office appropriation act there were certain directions given to the Secretary of Agriculture to ascertain the saving by means of the improvement of these post roads, and it devolved upon this division to obtain the required data.

The CHAIRMAN. How far have you advanced along that line?

Mr. PENNYBACKER. We have, I should say, completed about 75 per cent of it, and we hope to have it all completed by the late summer.

Mr. ANDERSON. What is the basis of that calculation?

Mr. PENNYBACKER. The item in the Post Office appropriation bill directed us to ascertain what would be the saving to the Government through the increase in the length of road that could be served by the same number of carriers, the decrease in the number of carriers or the decrease in the number of days on which mail could not be delivered on account of bad weather, the saving to the community in the cost of transportation, and the increase in the cost of maintenance

ver and above the cost paid by the community before the roads were mproved, necessary to keep them in good condition.

Now, you will see that there are a number of bases rather than a ingle basis of calculation. I might say, by way of example, that in aking up the question of hauling costs, we have endeavored to de- ermine for each road the traffic area which the road served before mprovement and the probable increase in such area after improve- nent. I might cite as a comparison the drainage area served by a vatercourse, for the traffic flows into the road much as the water lows into the stream from contiguous territory. We then as- ertained the kind and quantity of production in this area and the roportion of the products hauled on the road. This production re expressed in tons, and we then ascertained by traffic censuses the verage length of haul. That gave us the total ton-miles. In other ords, we ascertained the tonnage for that area, multiplied it by the verage haul, and obtained the total ton-miles hauled on that par- icular road. We were able to ascertain, by careful inquiry, the pre- ailing wage for men and teams in the community, and the average oads hauled, and thus we arrived at the ton-mile cost. A similar in- estigation after the post roads were improved gave us a comparison s to tonnage, average haul, ton-mileage, cost per ton-mile, and con- equently saving in hauling costs. Now, of course, there are a great any factors that enter into hauling costs, making it difficult to ate an exact money saving on account of road improvement, but we o at least get an indication of how much greater area that road serves nd how much greater tonnage can be hauled with the same motive ower, and if we measure these things in dollars and cents it is erely for the purpose of getting a basis of comparison between the ld and the new.

Mr. HAUGEN. Were the recent changes made in the rural routes ased on your estimates and the results of your investigations?

Mr. PENNYBACKER. I am sorry to say I can not answer that ques- ion, because the Post Office Department will deal with that particu- ar phase of the report, and their part of the report has not come o my attention.

Mr. HAUGEN. I was going to say that if it was, it was a mighty oor job.

The CHAIRMAN. Take up your next subject, that of the economic tudies of county and township highway systems.

Mr. PENNYBACKER. The inquiries which we have made have been largely by personal visits rather than by correspondence. Various counties possessing typical or exceptional features as to organiza- tion, finance, traffic, character and extent of materials, and types of construction have been selected for study, and we are now engaged in the work. A series of bulletins will be issued on the various phases of local road management.

Mr. ANDERSON. Have you any information as to the extent to which the practice of working out road taxes is still used?

Mr. PENNYBACKER. That is in effect to a very considerable extent; I should say in probably half the States.

Mr. ANDERSON. Have you any data on the amount of efficiency that results from that system and the system of paying such taxes in cash?

Mr. PENNYBACKER. The various States working out road taxes almost universall years ago, and the fact that a century of su good roads and that we were largely depend the substitution of a cash system in some c cate pretty clearly that that system did not rather difficult matter to reduce it down t certainly totally inefficient.

Mr. HAUGEN. Do you mean the present s

Mr. PENNYBACKER. The old system of v than employing men qualified to do the wo in cash.

The CHAIRMAN. Tell us about your ec highway departments.

Mr. PENNYBACKER. The economic study c ments is conducted largely by sending men of the various highway departments. In t study of their organization, their system of and specifications as far as we can fi and then we send men to the highway d haustive studies of their methods, the cost the work, and the results obtained. We sha each State will be dealt with on a basis o States. If one State has an overhead ex another one an overhead expense of 8 and it appears that the one with 5 per c same results as the one with 8 per cent to point out why the one with the overhea is able to do it so cheaply. We shall deal in with specifications, with standards, with tra costs, with report forms, with cost-keep features. We think that a comparative sho in the report will be helpful to all the States

The CHAIRMAN. Take up your next item.

Mr. PENNYBACKER. That is being done roads. It is more a maintenance than an e be dealt with by the chief of maintenance, under this division. The traffic census of have already explained, is for the purpose quired by that item in the Post Office appr soon brought to a close. Traffic censuses of gradually increase, however, and may offs census on post roads.

Mr. HAUGEN. How many miles of exper built by the department?

Mr. PENNYBACKER. I really can not answ chief of the maintenance division, could give

Mr. JAMES. About 32 completed.

Mr. HAUGEN. Thirty-two miles?

Mr. JAMES. Yes, sir.

Mr. HAUGEN. Throughout the country?

Mr. JAMES. No; right in the neighborhoo

Mr. HAUGEN. Were they built within the

. JAMES. No, sir; none in the District, except through sections e Agricultural Department grounds.
. HAUGEN. None were built between here and Baltimore?
. JAMES. No, sir.
. WILSON. One is out toward Chevy Chase, in Montgomery ty.
. ANDERSON. That is constructed now?
. WILSON. Yes, sir.
. HAUGEN. Different types of roads have been built under this imental project?
. WILSON. Yes; water-bound macadam, bituminous macadam, , concrete, and gravel.
. HAUGEN. How much gravel and clay and sand-clay?
. WILSON. On this experimental road?
. HAUGEN. Yes.
. WILSON. We are working on 3 miles now with a number of ent binders and have just put in 4 miles of road between here Alexandria.
e CHAIRMAN. Now, Mr. Pennybacker, take your next item, ice, lectures, and demonstration of road and bridge models, 00."
. PENNYBACKER. We have a model maker and we make in the l shop miniature models illustrating the various types of roads. e models are exhibited at fairs, State universities, highway con- ons, and other good-roads meetings. We pay no transportation ses for those models, the people who borrow them defraying ransportation expenses both ways. We pay the salary and the ses of the demonstrator where the exhibition is of sufficient size rrant it. In connection with the models, we have a large col- n of lantern slides used by the lecturers, and they are also d out to responsible parties, who pay the express charges both . The lecturers are not solely from the Economic Division. e are lectures given by other divisions, but the Economic Di- n does probably the bulk of the lecture work and keeps track If we have nobody available or suitable when a lecturer is l for, we take it up with the other divisions and have men as- d. The Economic Division is a sort of clearing house for the sion work of the office.
e CHAIRMAN. All your lecture work for the entire bureau comes gh this division?
. PENNYBACKER. Not all of the salaries are paid through this on; they are paid according to the division to which the lecturer gs. For example, if a lecture is given on bituminous binders oad material, that is given usually by a representative of the ion of Road Material Tests and Research, as that is the suitable on to deal with that subject. The requests all come through conomic Division and are kept track of so there will be no over- ng.
e CHAIRMAN. Now, your next item is "Instruction of students ghway engineering." I see you have temporarily suspended that and that there is no allotment.
. PENNYBACKER. Yes, sir.
e CHAIRMAN. Why did you suspend it?

Mr. PENNYBACKER. I believe that was do
States were, in their educational institutions,
of highway engineering on a much better scal
now have temporary road schools in the su
tutions are now establishing permanent road s
that the office could better devote its attenti
supervision in the field, leaving the States t
elementary instruction. One of the chie
instructing students in highway engineering
no increase in appropriation and, as the st
time developed into good men, we kept the
better for the office to do so than to drop them
new set of students. We were urable to do
appropriation.

The CHAIRMAN. You want a $5,000 increas
ment work. Why do you want that?

Mr. PENNYBACKER. The fact that we are n
of road management now, as a substitute fo
doing it largely by correspondence, necessari
more travel on the part of the represent
Of the $5,000 increase, $3,000 is all that is a
this additional travel and field study. As t
I may say that this is due largely to the enorm
for our models. The exhibition of these n
various types of roads, the preparation of t
the purchase of material, and some incident
increase in outlay. The expansion of our la
general work of that sort involves an incre
our collections to remain stationary, because
deal of their value. The photographic work
of the lantern slides and illustrations has al
because of the great popular interest in roads
for the exhibition and instruction work.

The CHAIRMAN. The committee will stand i
morning at 10 o'clock.

(Thereupon, at 5.30 o'clock p. m., recess v
February 4, 1916, at 10 o'clock a. m.)

HOUSE OF REPRESEN
COMMITTEE ON A
Frid

The committee met at 10 o'clock a. m., l
(chairman) presiding.

**STATEMENT OF MR. P. ST. J. WILSON, ASS
THE OFFICE OF PUBLIC ROADS AND RU
Continued.**

The CHAIRMAN. Mr. Wilson, turn now to
tions of the best methods of road making, etc.,
pert advice on building and maintenance, $14

Mr. WILSON. That appropriation, Mr. Ch
it was last year, exactly. The difference bet

ıd the $142,780 this year is covered by the salaries of people trans-
rred from the lump-sum to the statutory roll.

The CHAIRMAN. Will you either tell us yourself or have one of
ıe gentlemen in charge of this line of work tell us what is being
one and what you expect to do?

Mr. WILSON. We have that divided into maintenance and construc-
on work. Our maintenance work is more in the nature of investiga-
on, because comparatively little is definitely known about the
etails and cost of the maintenance of roads. We find that the con-
ition exists generally throughout the country in respect to roads
ıat have been built that they are not being properly taken care of.
'ithin comparatively recent years State highway commissions have
ken more and more interest in this work. That work is growing,
ıd it is our belief that very valuable service can be rendered through
e research work of our office as to the best methods of maintenance
ıd the publication of the results obtained for the information of
:ople who are undertaking road maintenance.

Mr. HAWLEY. I heard somebody say—I do not subscribe to the
ıtement—that the Office of Public Roads is devoting almost all its
tention to the construction of hard-surface and expensive roads.
y understanding is that you study the entire problem. Of course,
the United States, for a long while, the dirt road of some form
ll have more miles in use than any other form of road; and I
ıderstand you are working with and will counsel and help to build
rt roads just as much as any other kinds of road.

Mr. WILSON. I venture to say that for several years past more of
e work of the Office of Public Roads has been devoted to that class
roads than any other. We are willing to help all people anywhere
ıo ask for our help; but the States that are doing the most of this
gh-grade work are States that have departments that are able to
ke care of it. Our work is missionary and largely done in States
at have not well organized or equipped highway departments, or
hich have a comparatively small amount of money to spend. So
at in the South, Middle West, and extreme West we are doing our
ınstruction work and object-lesson work largely on the lower grade
asses of roads.

One of the biggest things we have is the maintenance of the road
:tween Richmond, Va., and Atlanta, Ga., in cooperation with the
merican Highway Association. They are furnishing an automobile
ır each of three men, and we have three men controlling that road
ıd directing the expenditures of the counties' money. Every bit of
ıat road, with the exception of a mile or two here and there, is
ravel, sand-clay, or dirt. I do not suppose there are 15 miles of
ıacadam road in the whole distance. That is the biggest single
roposition we have in the way of maintenance.

In construction it is more or less the same way. We have three or
our men in Kentucky, for instance. A new highway department
as been organized there. They were not financially able to do the
:ork they wanted to, and we have had three men down there with
hem for nearly a year on their road-investigation work.

But this investigational maintenance work—we have felt that there
s less known about that than about construction; and investigations
ıto the details and methods of this maintenance work will be very
aluable to State, county, and township officials. We are trying to

get all the information we can on that sub
work divided, as you see, into three heads:
tenance. In Massachusetts, New York, a
land States, and to some extent in Maryla
way. Second, we endeavor to get what
certain counties which have well-organiz
incidentally what information we can the

Mr. HAWLEY. You said yesterday, if I
practically ceased the training of studen
because of the lack of appropriations, an
being done in the several States in the ex
leges. Is it being done satisfactorily?

Mr. WILSON. It is not so much in the ex
leges, because the men we took in were n
college and whom we gave apprenticeship
work. We had always required a techni
nobody but the men who had a degree or
in civil engineering. One reason we have
said, that we have not had any increase in
years. Another reason is that we find our
bit overloaded with younger men. We w
them one year's training; then they bec
neers on promotion to the next grade: we
students. But our work is getting heav
important, and on that account we could
engineers to the best advantage. For in
a man to go to a county and lay out a
pare plans and specifications for a bond iss
and we can not take a man two and t
and put him on that sort of work. So
of those younger men as we feel we can
they have to work under the older and m

Another point that Mr. Pennybacker b
this matter of training highway-engineeri
was at a time when there were com
departments in the various States and t
trained. But now 43 States have highway
have pretty well organized highway depa
men, and those men, of course, working
practically the same training they would
Roads, though probably not quite as div
trained, however, and there are a great
neers in the country and men who are co
than there were when this course was start

Mr. HAWLEY. If a locality wishes to buil
have no difficulty, in your judgment, in g
constructor?

Mr. WILSON. They ought not to: if th
source, I think they can get the right men.

The great trouble we have found in a
thing is the tendency to hire a local man,
knows anything about the work or not.
other county or to the State highway de

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ben to have a suitable man in their own county, it ought to be ible to secure a competent one.
r. HAWLEY. Local pride is a good thing, but sometimes expensive.
r. WILSON. Sometimes it is expensive; yes, sir.
r. REILLY. Why can not those people, for instance, in building oad to Atlanta, Ga., hire their own men to supervise the work?
r. WILSON. They could; but we thought it was a chance to get rmation which we must have and which we feel is needed by our , and we are keeping an accurate account of the expenditures. the same time, it is a good object-lesson work. We go through ounties on this road, which is maintained by one of our best . You see, it is an object lesson for those people in the whole ounties. That is one road we have had. We probably will be to get one or two others in another section of the country. But ad of taking those three men and putting each of them to ntain roads in one county, where only three counties would get benefit, they are going through 49 counties, and 49 counties will the object lesson. And in that way we feel that a continuous is very much more valuable than to go into one county, because re really distributing the help on a larger scale.
he CHAIRMAN. More important than that, Mr. Wilson, it seems e, is the fact that your three men are getting the benefit of the ntenance system of 49 counties.
r. WILSON. We are maintaining a road in 49 counties having 49 rent conditions to deal with, and we are getting that information ch shape that we can give it not only to the 49 counties but to emaining 2,951 counties in the United States.
r. REILLY. Is not the most serious problem your department has al with the question of maintenance?
r. WILSON. I think so.
r. REILLY. Is not that the great problem in the matter of roads?
r. WILSON. I think the details of maintenance are further from g worked out and are less known about than construction, al-gh there are problems coming up in construction all the time are very important.
r. REILLY. Is not that a serious problem to-day in New York and States which were pioneers in the matter of road building?
r. WILSON. Yes, sir. The State highway department of Massa-etts, one of the oldest and one that has built a great many roads, eir last annual report said that they will have to practically ld all their roads to meet different conditions. That is not so maintenance as it is meeting changed conditions. Ten or fif-years ago, when they started, they had no automobiles and none ese heavy trucks. Now 75 per cent of their traffic is automobile.
r. HAWLEY. What is the matter with their roads now? Are too light?
r. WILSON. The automobiles are wearing them out. One reason have to rebuild them is because of the width; they are not wide gh for the present traffic. Now people go along at the rate of r 50 miles an hour, while 10 or 15 years ago the rate did not d, perhaps, 10 or 15 miles an hour in a horse-drawn vehicle.
r. REILLY. Have you had much experience with cement roads?

Mr. Wilson. I do not see why it should.

Mr. Bowley. Will it give as satisfactory service [illegible] of bituminous?

Mr. Wilson. It is longer lived, probably, and t[illegible] would cost less than the average bituminous road.

Mr. Bowley. Does not the frost interfere with ceme[illegible] pavement in the States?

Mr. Wilson. It has done so in the past, yet a g[illegible] mile [illegible] successfully. There is a very large mile[illegible] in Wayne County, Mich., which has been very s[illegible]

Mr. Bowley. Are you making some experiments [illegible] using a certain amount of cement to exclud[illegible] flow of water?

Mr. Wilson. That has been successful in buildi[illegible] more than anything else, but we have not found tha[illegible] of the road, and have not been us[illegible] work.

Mr. Bowley. Is it found that the frost interferes w[illegible] in Wayne County?

Mr. Wilson. Not to any extent.

Mr. Bowley. It does not interfere at all?

Mr. Wilson. Sometimes where the foundation is [illegible] of the cement, but it does not do it, or something [illegible] where the road is prope[illegible] [illegible] serious difficulty.

Mr. Bowley. Do you know some cases where [illegible] of the most of late? You could spe[illegible] [illegible]

Mr. Wilson. [illegible]

Mr. Bowley. [illegible]

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irman. It is perhaps not quite so important as it has been, there are object-lesson roads scattered pretty well over the , but still there are a great many counties in the States rep- g large areas and small mileage of road where a man may be stay a month or so and utilize the local materials they have of very great benefit to that country or locality. We have a any calls for that sort of work; we have not been able for the r to meet the number of calls.

UBEY. Are those roads made out of different materials—dirt, d gravel?

ILSON. We always try to utilize the local material, whatever re, taking into consideration the amount of traffic on the road er conditions.

HAIRMAN. How does the particular object-lesson road work om the line of work under item 45, for conducting field ex- ts?

ILSON. Conducting field experiments is a different thing en- You will notice how the language has read in the past, and t to ask you when we get to that item to restore the old e. The work is done largely in one locality. Most of this as been spent in the vicinity of Washington, and it has been ore economical to do that nearby, because we can keep these nder constant observation, note their wearing and keeping , etc. If we undertook experiments at Louisville, Ky., At- a., or Columbus, Ohio, we could not maintain close observa- cept at a much increased expense, as it would necessarily in- nding men back and forth. Besides, there are new materials ing, particularly bituminous materials, and new methods of them, and of using them, and so on, that are being tried. ases where we have built these roads we have made them in ctions, under identically the same conditions, so as to enable y out one kind of road material against another. For ex- ve built a road from Arlington cemetery to Alexandria. On d we have 19 different materials—that is, different combina- materials—which we are there trying out; some are gravel ne different kinds of stone; so that we can determine exactly ne same conditions which is the better material. If we built d of one material there and went over to Pennsylvania and other road with another material, we could not compare those ds because the traffic conditions would be different.

CLAUGHLIN. Have your observations on that road extended ne enough to draw definite conclusions?

ILSON. The road was just finished this past fall.

AWLEY. You have an experimental road in Maryland?

ILSON. We have one out in Montgomery County, toward Chase, beginning at Chevy Chase Circle.

AWLEY. You have there a number of different kinds of road tion?

ILSON. Yes, sir.

AWLEY. Which is standing up the best and which costs the r maintenance?

ILSON. I should say probably the brick is costing less for ance; is it not, Mr. James?

Mr. JAMES. Yes, sir; for annual expense.

Mr. HAWLEY. Is the original cost of brick construction greater or less as compared with the other units?

Mr. WILSON. Considerably more. Next to the brick is the concrete road. In constructing a brick road the cement foundation is first laid, and then the brick placed on top of the concrete, and it costs as much to make the foundation for the brick road as it does for the concrete road complete.

Mr. HAWLEY. Is the decreased cost of maintenance sufficient to offset the additional cost of construction—to amortize that increased cost?

Mr. JAMES. Those are the things we want to find out.

Mr. WILSON. It will take a long period of years and very exact data to find that out. We have built these roads around Washington and are watching the maintenance to find out those things, but we have not been able to work that out yet.

Mr. REILLY. Does not the character of the road depend on the kind of brick?

Mr. WILSON. Very largely.

Mr. REILLY. In my own town certain streets are paved with one kind of brick and another street paved with a different kind of brick, and we have a comparison of the wearing quality. My recollection is that the Metropolitan brick has stood up much better than one other brand of brick.

Mr. WILSON. We generally try to determine those things as far as we can by certain tests—rattler tests, etc.

Mr. REILLY. And some of those bricks will stand the rattler test and will not stand the traffic test?

Mr. WILSON. That is true.

Mr. HAWLEY. How they are burned determines how long they last, does it not?

Mr. WILSON. Yes, sir.

Mr. RUBEY. Referring to paragraph 43, how much of this $145,000 appropriated by the last Congress has so far been spent in the ordinary sand clay and dirt roads?

Mr. WILSON. That is very hard to say offhand. I could get that information, if desired.

Mr. RUBEY. I do not care for the exact amount, but about what proportion of the funds were used for that type of road?

Mr. WILSON. What proportion would you say has been used, Mr. Peirce?

Mr. PEIRCE. Probably more than half.

Mr. RUBEY. You are making investigations as to material and all that sort of thing. Have you made investigations as to the machinery with which to work on the construction of these roads?

Mr. WILSON. We have made some.

Mr. RUBEY. I want to say, in that connection, if you will pardon me, that during the last summer (I have 11 counties in my district) more work was done upon the public roads in our country last summer than has been done for five years preceding that. Every county with one or two exceptions, bought one of these big road machines costing in the neighborhood of $4,000 or $5,000. Some of them bought as many as three of those machines, and they go out and build from a half mile to three quarters mile of road a day with

se machines. They are doing great work in my country, and ist wondered whether you have ever investigated those things determined as to the advisability of using them on the roads of United States.

Ir. McLaughlin. What kind of materials are employed?

Ir. Rubey. They have dirt, gravel, and rock. They go right ough rock as big as a tub and throw it right out of the way.

Ir. Wilson. Of course, the conditions vary throughout the ntry, and we have to know the conditions before we can make ommendations, but our man, when he goes on the ground, does ommend, along with the kind of materials, the kind of machinery t is best adapted for the purpose.

Ir. Rubey. In my opinion, that is the thing to do in the con- uction of roads in my country. There is no question in the world out it.

The Chairman. Doctor, let me ask you this question: In item 43 u have this language: "For investigations of the best methods of id making, especially ordinary sand-clay and dirt roads," and n this language: "and the best kinds of road-making materials." In item 45 you have this language: "For conducting field experi- nts and various methods of road construction and maintenance," l this language: "and investigations concerning various road terials and preparations."

What is the difference in the character of work that you do under se two investigations, with respect to road materials? That ques- n, I think, was asked upon the floor of the House.

Ir. Wilson. Under item 43, we make laboratory tests and investi- ions of that kind. Item 45 is for the actual trying out of this erial on the ground—the actual construction of roads with those erials.

The Chairman. Item 43 covers laboratory investigations?

Ir. Wilson. Yes; and also investigations in the field. We will l an engineer to look over conditions, examine the materials, and ise as to which are best, and make necessary laboratory tests. under the other paragraph the work consists of trying out se materials in an experimental way, just as we do on this road n Arlington to Alexandria; that is, we actually build the road try out one material against another under the same travel ditions.

Ir. McLaughlin. Let me inquire a little further in regard to 43, rnishing expert advice on road building and maintenance." I recall t it was the policy of your office to furnish an engineer to superin- l and direct the construction of roads on condition, as I remember, t the muncipality, township, or county would follow the direc- ns of the engineer and practically turn over its entire road artment to be used by him. Have I the right understanding as he way you do that?

Ir. Wilson. We handle it in many different ways, sir. If the nty wants us to handle that work and be responsible for it, so t they can say that "the Office of Public Roads did this work," y, then, we want to have it done in the way we think it ought to done. If they just want advice, we can send a man there to ise them; but we feel, in justice to ourselves, if we have got to be

responsible for the superintendence, that the work might be carried on according to the ideas and specifications.

Mr. MCLAUGHLIN. The superintending of it, then, extends over the time required for the entire construction of the road, does it?

Mr. WILSON. The construction of a reasonable amount of it does so. We would not send a man there to stay, for instance, long enough to expend a big bond issue, running over several years, but he would stay there long enough to get the thing started in going; he would stay at some places longer than at others. It depends on how much demand there is for our men. Sometimes conditions may be such that we can get a man stay in a county a good deal longer than at other times, because there may happen to be no demand for his services elsewhere, but he does not remain in one place indefinitely.

Mr. MCLAUGHLIN. But the other kind of advice you give is a mere temporary matter—it may stay for just a short visit?

Mr. WILSON. Yes. A man will also be sent where there is any doubt as to materials. He would go down to look over materials and also as to whether to use gravel or stone or whether they can get a good soil to mix with the other materials and make a good road.

Mr. MCLAUGHLIN. Are those two kinds of work done under that one appropriation, item 43?

Mr. WILSON. Yes, sir.

Mr. RUBEY. Mr. Chairman, we amended that section in the last Congress by putting in the words "sand-clay and dirt," the idea being that we wanted to emphasize the fact that we desired the work done on the cheaper grade of roads.

Mr. WILSON. Yes.

Mr. RUBEY. And I wanted to know whether the department has carried out the idea of the committee?

Mr. WILSON. We have done that. I do not know that we have gone very much further than we had before. We had always been doing that work, but our work depends, to a considerable extent, on where the applications come from for our assistance. We do not force ourselves on anybody, and when a county in one of the Southern States or Middle Western States, for instance, asks for a man, and they have dirt conditions, we advise that: if they want to build a dirt road, we tell them to build dirt roads. They determine the kind of road they want to build as well as whether they want us to help them or not.

Mr. RUBEY. That being the case, I fear that most of your work is done close to Washington.

Mr. WILSON. No, sir; very little of our work is done close to Washington.

Mr. RUBEY. In giving illustrations you usually refer to some road in Maryland or Virginia.

Mr. WILSON. That is under clause 45, where they are building roads to watch and to experiment with.

Mr. RUBEY. How much work have you done this year or last year in Missouri?

Mr. WILSON. How much, Mr. Peirce?

Mr. PEIRCE. There has been very little construction supervised there, but we have had men in several counties to devise a system for them.

Mr. RUBEY. Those have been mostly devising systems of hard ds, where they are going to have a bond issue or something like t?

Mr. PEIRCE. I think that is so.

Mr. RUBEY. You have not done very much there in the way of t roads or roads of that sort?

Mr. PEIRCE. We have not received any requests for that.

Mr. RUBEY. What have you done in Kansas and out in that part of country?

Mr. PEIRCE. There has been a small amount of work done in Kan-, and there has been one earth object-lesson road at Hanover.

Mr. STEELE. Has there been anything done in Iowa?

Mr. PEIRCE. In Iowa we completed the building of a post road in one and Story Counties, about 50 miles in length, and the con-uction work in Dubuque County on the post road there is now der way. That is a gravel road.

Mr. STEELE. That was an appropriation whereby the Government id part of the cost, was it not?

Mr. WILSON. The Government paid one-third.

Mr. RUBEY. That came out of the $500,000?

Mr. STEELE. I would like to have you file a statement of your work ne in Iowa on the dirt roads for the last year, if you have a memo-ndum, to be printed in the record, to include the amount of ex-nditure you have made for the Iowa dirt roads.

The CHAIRMAN. Can you furnish that, Dr. Wilson?

Mr. WILSON. Yes, sir.

The CHAIRMAN. And the amount done in all the States?

Mr. WILSON. The appropriation in question was expended ap-oximately as follows: For the supervision of earth, sand-clay, and -soil roads, $64,855; for the supervision of gravel roads, $31,570; the supervision of macadam roads and more expensive types of nstruction, $37,510; for the design, preparation of plans, specifica-ns, and estimates, and supervising the construction of bridges, 682.

Mr. MCLAUGHLIN. Mr. Wilson told us of one particular job of ne considerable size they had something to do with—the 50-mile id through Boone and Story Counties. Would it not be interest-for you to tell us just what the Government did?

The CHAIRMAN. That comes under 45. I would much rather com-te this project and then turn to that in order.

Mr. ANDERSON. Have you discussed the concrete proposition under m 44?

Mr. WILSON. No, sir. The question that Mr. McLaughlin asked uld come under 43. The Boone-Story road is a post road built of the appropriation of $500,000. Mr. Peirce will tell you about it.

The CHAIRMAN. It would come under 43?

Mr. WILSON. Yes, sir.

The CHAIRMAN. You have said "post roads" down here in italics.

Mr. WILSON. That I want to explain to you when I get to it. I nt to ask the committee to allow the language of that item to nain what it is in the current appropriation act; but that is a intenance and not a construction proposition.

The CHAIRMAN. Very well. Let us hear from Mr. Peirce.

STATEMENT OF MR. VERNON M. PEIRCE, CHIEF OF ROAD CONSTRUCTION, OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING

Mr. PEIRCE. In Boone and Story Counties, Iowa, there was a road designated by the governor, upon request of the Postmaster General and the Secretary of Agriculture, for experimental improvement, the Government providing $10,000 and the counties $20,000. The law required that the State or subdivision should put up at least two dollars to the Government's one. The counties afterwards added about $13,000 to complete the road.

Mr. MCLAUGHLIN. Is that the law or a requirement of the department?

Mr. PEIRCE. That is the law.

The CHAIRMAN. Go ahead and state what you did out there?

Mr. PEIRCE. That consisted of building an earth road, including the reduction of grades and the proper grading and draining of the roads. Our traction tests have shown us, since the completion of the road, that the draft has been decreased 35 per cent on the average.

Mr. ANDERSON. Was there any gravel used in this construction?

Mr. PEIRCE. No gravel was used.

Mr. MCLAUGHLIN. Just what did you do or your men under you? Give us that in some detail. That is what I would like, and I thought possibly the committee would like that also to know just how you are spending this money.

Mr. PEIRCE. In the first place, of course, we find an old traveled way that perhaps is not properly located, and we can locate it in a nearby place, where we can reduce the grade. The traveled way has to be widened. It may have been a road that was low in the center, so that the water ran down the center, and we crowned it so as to have the water run off the sides. There may not be proper drainage structures, and we build those to take the water under the road and away from it.

Mr. MCLAUGHLIN. That is a more or less common way of building a road. We find conditions of that kind everywhere. But I would like to know what part you or your men working under your direction [illegible]

Mr. PEIRCE. The part we do is to make the survey and prepare the plans for the work, then state it out, and then superintend the construction according to those plans and specifications which we have prepared.

Mr. MCLAUGHLIN. How many men were employed on that ground [illegible]

Mr. PEIRCE. There were three men engaged on that work—[illegible] and two young men who were either [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. PEIRCE. [illegible]

Mr. [illegible]

Mr. PEIRCE. [illegible]

Mr. RUSSELL. [illegible]

Mr. PEIRCE. [illegible]

Mr. RUBEY. What kind of machinery did you use in constructing hat road?

Mr. PEIRCE. The common road grader—slips.

Mr. RUBEY. You just plowed it up, took some graders and rolled t up, and so forth?

Mr. PEIRCE. Yes, sir.

Mr. RUBEY. You did not use any big machine that would do a hole lot of work all at once?

Mr. PEIRCE. In that country there I think the machinery we used as the best that could be used.

Mr. RUBEY. What kind of country was it—prairie?

Mr. PEIRCE. No, sir; quite a rolling country.

Mr. RUBEY. Rock and gravel?

Mr. PEIRCE. Not much rock or gravel.

Mr. RUBEY. I live in the Ozarks. You know how rough that is, o you not?

Mr. PEIRCE. Yes, sir.

Mr. RUBEY. We use those machines down there in our hills right long. The best road we have got was built by those machines right long the side of a big hill. The machine took the dirt out from the pper side of the road, and then took out the ditch on the other side, nd, using the material at hand, a gutter road was made that will ist for years to come.

You are referring to an ordinary grader?

Mr. PEIRCE. Yes, sir.

Mr. RUBEY. Did you use horse power or engine power?

Mr. PEIRCE. Either can be used.

Mr. STEELE. What did you use?

Mr. PEIRCE. Horse power was used.

Mr. RUBEY. When you are using horse power in making that kind f roads you are about 25 years behind the times.

Mr. PEIRCE. One thing that you have to consider are the facilities iat the communities have or will secure for you.

Mr. RUBEY. You have the money, and it takes money to get these iachines, and you want to use your money to the best advantage; nd if it is to your advantage to buy a $5,000 machine, run by a asoline engine, it would be better to go out and get that machine nd build ten times as much road as you would build the other way.

Mr. HOWELL. You are not given plenty of money for the construc- on of these roads; your duties are confined——

Mr. STEELE. Mr. Chairman——

Mr. ANDERSON. Let him answer the question.

Mr. LEE. You do not spend any money on the machines? The ounties have to buy the machinery?

Mr. PEIRCE. None of that money was to be expended for ma- iinery.

Mr. RUBEY. You have an appropriation of $500,000 from the Gov- rnment. That is prorated out out. The State pays two-thirds of ie money and the Government pays the other third. Now, they ut that money together. How much was it altogether to be used n this road?

Mr. PEIRCE. $30,000 at first, and later $13,000 was added by the ounties.

Mr. RUBEY. $20,000 of it supplied by the State and $10,000 by the Government?

Mr. PEIRCE. Yes, sir.

Mr. RUBEY. The thing to do with that $30,000 is to get the best results out of it, and, if you can get the best results by going out and investing $5,000 in a machine, is not that the thing to do?

Mr. PEIRCE. The appropriation, as we understood it, was to be used for the purchase of machinery.

The CHAIRMAN. Was there a limitation?

Mr. PEIRCE. It was all used in the construction of the road.

The CHAIRMAN. You had to go and buy graders, did you not?

Mr. PEIRCE. The county had the graders.

The CHAIRMAN. The members of the committee are talking at cross purposes. I do not think Mr. Peirce understands your position. Are you permitted to invest that appropriation of $500,000 to buy machinery for the Government?

Mr. PEIRCE. No, sir.

The CHAIRMAN. Then you have to depend entirely on the machinery furnished you by the county: is that the idea?

Mr. PEIRCE. That is the idea.

Mr. HOWELL. I would like to know if you are permitted to expend any of this money in the construction of the road? Are your duties confined to supervision and direction?

Mr. PEIRCE. That money was for the purpose of paying for labor and materials for the construction of the road.

Mr. HOWELL. Is the money placed in the hands of the Office of Public Roads for expenditure, or is it expended by the State?

Mr. WILSON. The road we built was paid for out of this special appropriation of $500,000, made in 1912 to the Post Office Department. We can not spend any of this money under item 43 for machinery. Authority to purchase machinery under that item was cut out a few years ago.

The CHAIRMAN. That is very true, and I would like to know whether or not you were likewise prohibited with regard to this appropriation of $500,000?

Mr. WILSON. Either by law or the comptroller's decision; I am not sure which, but one or the other.

Mr. STEELE. I want the witness to state just how he built this road, how much expenditure was put upon it out there, and how much expenditure was put on this road in the vicinity of Washington. He said that this project lasted over a year, and he had so many men employed for that length of time. I want to know whether it is necessary to employ civil engineers for a year to build a 4-mile road, and I want to know just how much money was spent on this particular road. That is the question. I don't want you to get off onto the other proposition at all.

The CHAIRMAN. Can you answer, Mr. Peirce?

Mr. PEIRCE. The amount, as stated, was altogether $43,000 for the improvement of practically 50 miles of road. That money was all spent in the payment of labor and teams in handling the earth and in the construction of the drainage structures.

Mr. STEELE. Who had charge of the payment of this money?

Mr. PEIRCE. The superintendent of construction made the estimates monthly and the county paid the money, and when that was

re our superintendent made out a voucher for the Government to mburse the county for one-third of it.

Mr. STEELE. Then that expenditure was administered by the county which the road was located?

Mr. PEIRCE. Yes, sir.

Mr. STEELE. I want to know what expense the Government was in the construction of this road. As I understand it, they re-sted you to make a profile of this road; is that the idea?

Mr. PEIRCE. Yes, sir.

Mr. STEELE. You took your civil engineer and you laid out this d according to grades, etc.; is that true?

Mr. PEIRCE. Yes, sir.

Mr. STEELE. How many men did you have on that work?

Mr. PEIRCE. The work of making the survey was done in coopera-n with the State highway commission. We had only one man gaged on it and they had two or three, as might be necessary at the ne the work was going on.

Mr. STEELE. How long did you have one man on this work?

Mr. PEIRCE. As I stated before, from the start of the work until was entirely completed. It was probably a little more than one ar, largely due to the fact that the winter season intervened and the rk had to be stopped and resumed in the spring.

Mr. STEELE. Did your expense continue that year?

Mr. PEIRCE. No, sir; we had no men on the work, of course, when ere was no construction going on.

Mr. STEELE. A moment ago, in reply to Mr. McLaughlin's in-iry, you said you had three men for a year locating this road and nstructing it.

Mr. PEIRCE. I did not mean to make any such statement.

Mr. HOWELL. Have you in your mind just what was paid for the erhead charges in building this road?

Mr. PEIRCE. It was approximately $10 a day for the three for the ne the construction was going on.

Mr. HOWELL. What was the total amount paid for supervising e construction of the road—that is, the part you took in its con-ruction?

Mr. STEELE. How much of this fund was appropriated for that work?

Mr. PEIRCE. $4,215.17.

Mr. MCLAUGHLIN. Is it not true that one or more of your engineers those who took part in the work, as you describe, were paid out your regular appropriation? Were they not the regularly em-oyed engineers paid out of other appropriations, or, if not, what rt of it was paid out of this $30,000—the $10,000 that was paid t of that $500,000 and the $20,000 paid by the State?

Mr. PEIRCE. The salaries of our engineers engaged on that work is paid out of this fund, the item which is under discussion now.

Mr. MCLAUGHLIN. Then, we understand the entire amount of that 0,000 was devoted to the actual work and expense of construction?

Mr. PEIRCE. Yes, sir.

Mr. ANDERSON. The superintendence was paid out of the item un-r discussion.

Mr. STEELE. Now, whatever expense was necessary to build and mplete this road—$30,000—is true of all the other roads in the ner States that you constructed out of the $500,000?

Mr. Berry. Is not that rather an expensive propo

Mr. Steele. It seems to me that is an awfully expe
farmers can do it a great deal cheaper than that.

Mr. Berry. The farmers built that.

Mr. Steele. They are building good roads and the
build roads, too, in Iowa and eastern Dakota.

Mr. Berry. I am not criticising the department i
tion of that road in Iowa. If they were prohibited by

r. STEELE. The county organizations have these machines in y precinct.
ie CHAIRMAN. I do not remember the history of that proposition. whole proposition of the Office of Public Roads is a matter of te that has been before Congress for a long time. I may say I not make a point of order if somebody wants to strike it out. I let the House vote on it. It is a very important proposition.
r. STEELE. What I want to know is what expense this department ing to in locating a road in comparatively level country, and ems on this one item they can give us that expense account.
ie CHAIRMAN. That is what this appropriation of $500,000 is e for, Mr. Steele—to find out for what amount the common dirt s over which rural delivery routes go might be constructed.
r. STEELE. Yes; but on any particular item of construction you the expense account.
ie CHAIRMAN. Certainly, and you have it here; but what they are ig to get at is an average.
r. MCLAUGHLIN. This contribution by the Government out of this ,000—$10,000 in this particular case—was not used at all for the rvision.
ie CHAIRMAN. No.
r. MCLAUGHLIN. Or for any of the work evidently done by the als or employees of the Office of Public Roads. That entire 00 went for the actual physical work of that road.
ie CHAIRMAN. And you remember, Mr. McLaughlin, that this nittee for this fiscal year allowed the increase on account of this al appropriation?
r. MCLAUGHLIN. There is another thing. I am not a road ler, but it would seem to me that the material out of which a is to be built would determine what kind of machinery is to be . I would doubt very much whether one of these very heavy rs spoken of by Gov. Rubey——
r. RUBEY. I did not say "roller"; I said engine.
r. STEELE. Engine with an elevator—with a machine that ele- the dirt and puts it into the road.
r. MCLAUGHLIN. I was going to say that I doubt very much her that heavy expensive machinery would be necessary for the n roads to be made out of soil that is easily handled.
r. RUBEY. It is more necessary there than anywhere else.
r. LEE. Mr. McLaughlin, I agree with Mr. Rubey that, where a y is able and is going to build many miles of roads, it pays to he best machinery.
r. HELGESEN. On these dirt roads, in a level country, did you in mind the use of the most modern, up-to-date machinery when nade that estimate of $1,000 or $2,000 a mile?
r. PEIRCE. That very seldom has been supplied us. In fact, I ot remember of any case where it has been.
r. HELGESEN. Then, your estimate is not worth much, because in ing roads you can not build them economically unless you do graders that will do it rapidly and economically. If you try to by hand work it may cost three or four times as much as it l with modern, up-to-date machinery.
. MCLAUGHLIN. But it has been the policy of this committee to e permission to use Federal money for the purchase of this ma-

money. We can not take the position that their work should be [illegible] supervision and leaving it to the [illegible] machinery with their own money.

Mr. [illegible] take a little inquiry before you start [illegible] demonstrating how a road is to be built, [illegible] counties and communities which have modern machinery [illegible] such as an Erie grader, an [illegible] from the ditch over the elevation [illegible] of the road in one continuous movement [illegible] seems to me that you ought to select those [illegible] money to work with and not to try to [illegible] There is nothing you can tell them [illegible] they will do it or not. If you want [illegible] built economically, you [illegible] money and the [illegible]

[illegible] money expended by [illegible] on these roads represent administration charges, such as telling them how to do it—superintending their work?

Mr. [illegible] talking about money used out of [illegible]

[illegible] under this item.

[illegible] money is expended in the payment [illegible] engaged in this education [illegible]

Mr. [illegible] that is built at a cost of $1,000 or $2,000 [illegible] be represented by the money that [illegible] necessary in the way of supervision?

Mr. [illegible] any way of estimating that.

Mr. WILSON. We do not charge as supervision the traveling expense of the man in getting to the work. A county in Missouri [illegible] Western State might call on us to send a man [illegible] road. If we had to send a man two or three States away, it would be [illegible] traveling expenses as supervision of that particular piece of road. But, outside of that it would vary from 5 to 10 per cent [illegible] conditions.

Mr. HOWELL. If you are going to find the estimated cost of building [illegible] want to take the practical side and not [illegible] extraordinary amounts for supervision. What [illegible] to know what it is going to cost him, when [illegible] superintendent of construction has left it.

Mr. HOWELL. Mr. Chairman, it seems to me, you have spent [illegible] this appropriation of $500,000 something like $1,000,000 in building roads, which have been constructed under the supervision of [illegible] Bureau. What I would like to know about is what percentage of the actual cost of the road is paid to their engineers and supervision out of this appropriation.

Mr. WILSON. This appropriation here?

Mr. HOWELL. Yes; the regular annual Agricultural appropriation act.

The CHAIRMAN. Can you furnish that?

Mr. WILSON. We can furnish that; yes. We can not do it off hand, however.

STEELE. I want to ask a question. Have you investigated the
t price made by certain counties as to what they pay per mile
t roads in their counties? Have you determined or found out
ounty commissioners pay when they let contracts for several
hrough the county each season? Now, as Mr. Helgesen says,
tell the farmers that this dirt road is going to cost $1,000 a
ey are not going to be interested very much in the construction
s.
HOWELL. All the testimony we have has shown dirt roads cost-
t $1,000, but $500 or $600.
STEELE. If that is true, you are going to discourage farmers
uilding dirt roads. Is it not a matter of fact that a machine
y equipped, with 14 or 16 horses or an engine, will build a
good dirt road a day?
WILSON. Under certain conditions that can be done; yes, sir.
STEELE. What conditions?
WILSON. Where the road is workable; where you are just go-
build the road along the surface and do not have hills to cut

STEELE. Mr. Helgesen asked you how much it would cost on
country and with black loam soil, and you said it would cost
to $2,000 a mile.
WILSON. I think that estimate was really a little high. That
. Peirce's suggestion, not mine.
PEIRCE. I stated what the roads had cost, and those were short
hat perhaps would not answer as a basis for an estimate for a
rable mileage.
ANDERSON. Does that include bridges and culverts?
PEIRCE. Those always have been included in our costs.
REILLY. Mr. Peirce, I understand that the United States did
t anything into the road in Iowa in addition to this fund,
, and that $20,000 contributed by the State?
PEIRCE. $10,000 appropriated by the Federal Government
hat 1912 act, but not in this act. In 1912 there was an appro-
n of $500,000, to be spent under the joint direction of the
ster General and the Secretary of Agriculture.
CHAIRMAN. That was carried in the Post Office appropriation

PEIRCE. That was carried in the Post Office appropriation act,
was out of that fund the $10,000 was taken, in addition to
$20,000 was put up by either the counties or the State.
LEE. That appropriation provided each State in the United
with $10,000?
PEIRCE. No, sir. The act did not specify the amount that
be expended in each State.
MCLAUGHLIN. In expending that money no part of it was
r the salaries or expenses of the experts? Their salaries and
es were paid out of these regular appropriations?
WILSON. They are regular employees of the office.
CHAIRMAN. That was understood by the committee last year.
STEELE. Then I want you to state whether whatever expenses
d out of this fund to construct this road was true as to every
State in the United States.

The CHAIRMAN. This special act to which we have been referring requires a report to be made by the Secretary of Agriculture and the Postmaster General as to the location of these various roads and their cost of construction?

Mr. WILSON. Yes, sir.

The CHAIRMAN. Will you be able to put into your remarks a statement showing just how many roads you have built and where they are located, how much was contributed out of the $500,000 by the Federal Government, how much by the State or county government, and how much expended on each of these roads was for supervision by your office under the appropriation carried in the regular annual appropriation act for the Department of Agriculture?

Mr. WILSON. I think we can.

The CHAIRMAN. Is that what you are driving at, gentlemen?

Mr. WILSON. One or two roads are not yet completed, but so far as we have gone we will do that.

(The statement referred to follows:)

CONSTRUCTION OF POST ROADS IN THE UNITED STATES.

Statement showing the location, mileage, type of road, and funds allotted by the Federal Government and by States and counties for the period from Aug. 24, 1912, to Jan. 1, 1916.

Location.	Length (miles).	Type of road.	For construction.			Paid from Federal funds[1] for surveys, plans, and supervising construction.
			Allotment from Federal funds.[1]	Allotment from local funds.	Total.	
Alabama, Lauderdale County.	19.30	Earth and sand-clay.	$9,931.48	$20,000.00	$29,987.18	$4,276.98
Iowa, Boone and Story Counties.	44.00	Earth	9,999.50	33,014.70	44,014.20	4,277.17
Iowa, Dubuque County	20.00	Gravel	30,000.00	60,000.00	90,000.00	[4]
Kentucky, Bath and Montgomery Counties.	10.80	Macadam	13,100.00	32,444.96	45,544.96	7,417.96
Maine, Cumberland County.	20.94	Bituminous macadam.	65,000.00	180,735.95	245,735.95	7,451.06
Maryland, Montgomery County.	5.40	Macadam	14,700.00	30,445.15	45,145.15	4,442.15
Mississippi, Leflore County	21.80	Gravel	50,000.00	100,676.78	150,676.78	9,536.98
North Carolina, McDowell County.	13.76	Earth	10,000.00	30,000.00	40,000.00	"
North Carolina, Forsyth, Davie, and Iredell Counties.	50.82	Sand-clay top-soil.	25,094.10	74,659.52	99,753.62	6,415.47
Ohio, Muskingum and Licking Counties	23.97	Portland cement concrete.	120,000.00	320,000.00	423,753.14	7,753.77
Oregon, Jackson County	71.00	Earth and macadam.	9,999.98	20,000.00	29,999.98	4,059.16
South Carolina, Aiken County.	26.98	Sand-clay top-soil.	10,000.00	20,000.00	30,000.00	7,085.71
Tennessee, Loudon County	6.10	Macadam	10,800.00	21,600.00	32,400.00	4,358.85
Tennessee, Montgomery County.	7.65	Earth and macadam.	10,000.00	22,421.74	32,421.74	4,171.15
Texas, Travis, Hays, Comal, Guadalupe, and Bexar Counties.	71.11	Gravel	76,625.00	171,225.00	[3]235,989.10	12,727.00
Virginia:						
Fairfax County	12.53	....do	16,900.00	37,805.75	54,705.75	4,775.96
Spotsylvania, Caroline, and Hanover Counties.	33.80	Sand-clay and gravel	17,756.44	35,570.73	53,327.17	4,415.07

[1] Post Office appropriation act of Aug. 24, 1912, providing $500,000 for the construction of post roads.
[2] Agricultural appropriation acts, road building and maintenance.
[3] Road practically completed.
[4] Road 30 per cent complete.
[5] Road 75 per cent complete.

Mr. HELGESEN. Have you issued a bulletin already telling how to build ordinary dirt roads?

Mr. WILSON. Yes, sir.

Mr. PEIRCE. There was some years ago. That is out of print and another one is now under preparation.

Mr. HELGESEN. How soon will that be out—before spring?

Mr. PEIRCE. In a month or so.

STATEMENT OF MR. CHARLES S. REEVE, CHEMIST, OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

The CHAIRMAN. Take up item 44, Capt. Wilson, and tell us briefly what you do under that.

Mr. WILSON. Mr. Chairman, that investigation of the chemical and physical character of road materials is under Mr. Hubbard, who is out of the city. His work is divided into two parts—the chemical testing of road materials and the physical work—and I am going to ask you to hear Mr. Reeve on the chemical work and Mr. Goldbeck on the physical laboratory work.

Mr. REEVE. The chemical work consists in investigations of the various bituminous binders and also some of the nonbituminous binders which are now used in road construction. We examine samples in an effort to assist county authorities and good-roads associations in securing satisfactory materials for the class of work which they have in mind, and, incidentally, the study of materials has resulted in the preparation of specifications for the type of material.

The type of material adapted to any particular piece of construction in any locality differs very largely, depending upon the traffic conditions. Well-drawn specifications are necessary in order to insure the material that is best adapted for the particular purpose. Incidental to the routine testing, we are continually making researches on the utilization of these materials in new forms of construction; and I think that this assists in answering one of the questions that came up here to-day regarding the attention that has been paid to the economical types of construction—earth, clay, and topsoil. So far we have really been unable to find any method of treating topsoil or earth with bituminous material to be sure of our results in every case. In many cases the application leads to worse results than before applied.

Mr. ANDERSON. What do you mean by "bituminous"?

Mr. REEVE. Products of petroleum, asphalt, and tar products; they are the principal types of materials with which we have to deal.

Mr. ANDERSON. Do I understand you to say that you find, where road is properly graded up, that the use of bituminous binders is sometimes found to be unsatisfactory?

Mr. REEVE. I am speaking particularly there of earth or topsoil roads.

Mr. ANDERSON. What would you say in the case of gravel road with an oil binder

Mr. REEVE. That is somewhat related to the same proposition that we are investigating under another part of our appropriation, with

... [illegible] ... [illegible] ... [illegible]

Mr. REILLY. What kind of oil do they generally put on highways macadam?

Mr. REEVE. They use almost anything from crude oil up to a very avy refined product out of which the kerosene and gasoline have en taken, and that of course has to be heated and put on under her high temperature.

On our roads from here to Rockville and from Rockville to Po-nac, we have experimental surfaces and are trying out at present, conjunction with the Division of Maintenance, of which Mr. mes is chief, a series of experiments which have been running now ce about 1913, in which we have used cold and heated applications oils—Mexican crude and refined, Trinidad refined and crude, coal-, and water-gas tar, from which we are assembling accurate main-ance data. We have frequently treated these roads during the st year or two, in order to maintain them in a first-class condition.

Mr. MCLAUGHLIN. Are any one of these materials spoken of called Tarvia"?

Mr. REEVE. Yes; we have some "Tarvia" out there.

Mr. MCLAUGHLIN. What other names have you? You did not e that term.

Mr. REEVE. "Tarvia" is simply a trade name for a certain line of al-tar products manufactured by a certain company. You can y essentially the same material from another company under the ide name of "Taroid," and still another company puts out a similar oduct known as "Tarite."

Mr. MCLAUGHLIN. What results have you had using the different nds of "Tarvia" or what are the same things as "Tarvia"?

Mr. REEVE. Comparatively?

Mr. MCLAUGHLIN. Yes; and in any other way. I would like to ow what the success has been.

Mr. REEVE. A section of the Rockville pike was treated with hot Tarvia" and went through practically two years with compara-rely light repairing and patching before it needed another treat-ent to preserve it. That was the experience with that particular ade of material.

Mr. REILLY. One treatment in two years?

Mr. REEVE. Eighteen months to two years, with treatment applied the second year.

Mr. REILLY. Is that "Tarvia" dear or more expensive than crude ?

Mr. REEVE. Yes; it is more expensive.

Mr. REILLY. What made me ask the question was that up in Wis-nsin we are building a great many miles of macadam road costing ,000 or $2,500 a mile, and they have been going into this oiling siness and oiling with crude oil, their idea being that after awhile, a few years, they will not have to put it on so often.

Mr. REEVE. That will all depend on the character of the crude oil ed. Our eastern petroleums are useless, except for dust laying over period of comparatively few weeks, under very heavy traffic. Our stern crude oils and California crude oils are very efficient as-altic oils and quite durable. The Mexican and Trinidad oils which me into this country are also rather durable. I should say with

[illegible]

Mr. REILLY. [illegible] than to let the [illegible] with [illegible] the use of [illegible]

Mr. [illegible]. Incidentally, of course, [illegible]

Mr. [illegible] the use of some of these [illegible] used in the construction of the road?

Mr. [illegible] which we might try to [illegible] there are [illegible] from the market which tend to be [illegible] It is one of the [illegible] and eliminate that kind of material.

Mr. [illegible] Wisconsin, is more of a top dressing [illegible] make the road this year, then in the spring, then will apply the oil and follow it the year after, and generally the oiling goes through a season and keeps it in good shape.

Mr. HERSEREE. That not only keeps the dust down but also sheds the water.

Mr. REILLY. It preserves the road, and it is particularly effective where you have automobiles, as it keeps the automobiles from tearing the road up; but the question which is bothering the people up there is whether they will have to continue that or whether it will accumulate a kind of asphaltic top after repeated oilings.

The CHAIRMAN. What is your judgment on that?

Mr. REEVE. From some observation I should say it will tend to form an asphaltic carpet. Just how long that carpet will endure before it begins to break up and require patching is a question entirely dependent upon local conditions.

Mr. MCLAUGHLIN. This oil you speak of is more of a dressing than a binder?

Mr. REILLY. Absolutely a dressing put on the year after the road is made. For instance, you construct a road this year, and for a month or six or seven months it is just as level as that table, and, without oil it will get loose and torn up. The idea is to put the oil on the second year to shed the water. Water is what raises trouble with the macadam road and then repeat it. Of course, if they have to repeat it every year it is going to be an expensive proposition. The question is, What is the best kind of an oil material that will go the farthest?

Mr. REEVE. Of course, the second and third treatments are light compared with the first. The first treatment will require half a gallon to the yard, whereas the second and third treatments will be cut down to one fifth or even less than that—sometimes as low as one tenth gallon. The later treatments are very cheap as compared with the first.

Mr. HUTCHESON. Let me ask Mr. Peirce one question: On that estimate of $1,000 or $2,000 a mile for dirt roads, did it include any kind of top dressing?

Mr. PEIRCE. No, sir.

ATEMENT OF MR. A. T. GOLDBECK, ENGINEER OF TESTS, OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

Mr. WILSON. The other part of the work under this item, Mr. airman, is the investigation of the physical properties of road terials, which is under Mr. Goldbeck.

Mr. GOLDBECK. The physical laboratory does work somewhat simi- to the chemical laboratory, except that Mr. Reeve treats of the emical properties of bituminous road materials and we deal with e physical properties of nonbituminous road materials. By "non- tuminous" road materials, of course, I mean rock, gravel, sand, nd-clay, etc. In testing rock we try to make such tests as will pre- termine the usefulness of the rock in macadam-road construction. e all know that macadam roads are worn away due to certain ysical actions. For instance, the rock receives a pounding action e to traffic; it receives a shearing or abrasive action; and, more- er, the individual particles of the rock are pushed and pounded t of place by the traffic. We make tests to determine whether a rtain type of rock is suitable for a certain kind of conditions. For stance, we make tests of the toughness, of the hardness, and of e cementing qualities of the rock. We try to recommend such mples as are submitted for their particular use, but limestone we dinarily find is lacking in toughness and hardness.

Mr. ANDERSON. Let me ask you something about limestone rock. e have a great deal of it up in Minnesota, and we find, if it is ed with cement, it finally becomes like a piece of chalk. You can ke a knife and cut it, and it finally disintegrates entirely. Have u had any experience of that kind?

Mr. GOLDBECK. There are various kinds of limestone, depending on their composition. For instance, we have siliceous limestone d argillaceous limestone—that is, a clay limestane. A siliceous nestone would be sand-limestone mixture. The chemical composi- on has much to do with the behavior of the rock you speak of.

Mr. HELGESEN. But, after all, in every community does it not be- me necessary, as a practical proposition, to use the rock in the mmunity?

Mr. GOLDBECK. That is very true. It is almost necessary to use e rock in a community, but in that one community there may be veral different quarries, all close to the site of the road, and often- nes we can by making physical tests predetermine which rock is e best for the road under construction.

Mr. CANDLER. Doctor, have you not made the tests out here near ievy Chase of various varieties of roads, in sections, and obtained cords in regard to those tests?

Mr. GOLDBECK. The work you refer to, I presume, is the work on onnecticut Avenue?

Mr. CANDLER. Yes, sir.

Mr. GOLDBECK. That work is of the bituminous construction. Our ysical laboratory deals with the characteristics of rock.

Mr. CANDLER. I understand the tests out there were made with sec- ons of roads constructed of various kinds of materials and that cords were being kept to show not only the durability of the differ- t types but the cost of maintenance; that you were testing the road

road. In the first place, let me say that gravel, as u
of for road construction, is composed of a number
of particles. They may extend from the very s
down to exceedingly fine material, which we will
grading—that is, the relative proportions of these
determines the density of that gravel in the road. I
eal of one size—for instance, spheres of ½ inches
will not pack so closely as spheres varying in size.
we test these gravels in order to determine their pro
the road.

Another thing, different gravels cement together
depending on the amount of cementing material
gravels will cement together very well and others
together at all, and so one of our tests consists in ex
mine the cementing quality of these gravels.

Mr. McLaughlin. If this is the right place to as
would like to know, if a sample of stone or gravel
office, whether you will analyze it or otherwise in
advise whether or not it is good material, or how
or the kind of binder which should be used with it?

Mr. Gutensohn. Yes; that is the function of the la

Mr. McLaughlin. Just tell us a word as to the pr
do. Do you receive those things, and what do you
What do you determine and what report do you mak

Mr. Gutensohn. Suppose some community wants
They will send us a sample of rock, and they will say
suitable for our conditions?" We analyze the samp
of our prescribed tests—all the tests we think wi
suitability of that rock for use in the road—and we
the tests give us certain numerical data. Judging
merical data, we are enabled to determine from the p
of a rock having similar physical properties how th
to behave in the road, and after conducting tests w

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Mr. GOLDBECK. We can say very definitely whether a binder should used or whether it will not be necessary.
Mr. MCLAUGHLIN. And if such kind of a binder is necessary or visable, do you advise them?
Mr. GOLDBECK. Of course, our laboratory is physical and deals th nonbituminous materials. Such questions we refer to Mr. eve, of the chemical laboratory. He will recommend what kind of inder should be used if that is necessary. We can tell whether a der will be necessary; if it is necessary, Mr. Reeve's department take care of that.
Mr. MCLAUGHLIN. How much and how it should be applied?
Mr. GOLDBECK. Exactly.
Mr. CANDLER. May I inquire whether or not tests have been made Tishomingo gravel from Tishomingo County, Miss.?
Mr. HAWLEY. Does it come out of the Tombigbee River?
Mr. CANDLER. No; it comes from Tishomingo County; and, talkg about binders, it has the peculiar combination which cements the avel together. The Southern Railway owns a gravel pit 3 miles st of Iuka, and that whole road is ballasted with that gravel. The obile & Ohio Railroad owns a gravel pit also, and its road is balsted with the material. The streets of Memphis, Tenn., are paved th it; the streets in my own town of Corinth are also paved with I wanted to know whether or not you have had the opportunity examing that gravel. It furnishes its own cement and makes a lid concrete gravel foundation whenever used.
Mr. WILSON. We are familiar with that gravel, and it gives good sults in the roads.
Mr. CANDLER. My information is that it is about the best in the nited States.
Mr. MCLAUGHLIN. Is it found in any other places?
Mr. CANDLER. It is not found elsewhere, except in Illinois.
Mr. MCLAUGHLIN. I wish you would give us the name by which it known in your office.
Mr. JAMES. Novaculite.
Mr. MCLAUGHLIN. Where is it found?
Mr. JAMES. Near Corinth and Iuka.
Mr. MCLAUGHLIN. And only there?
Mr. JAMES. That is the only place; but a similar material—not extly the same—is found in southern Indiana and in Illinois.
Mr. CANDLER. They have used it at different places in Mississippi, id the Tishomingo gravel has proved to be superior.
Mr. STEELE. It is known to the office? Would it be practicable ship that gravel from Mississippi into Iowa?
Mr. GOLDBECK. No.
Mr. STEELE. As a matter of fact, if you wanted to build a gravel ad in Iowa, you would have to use the gravel contiguous to that ad, easily handled and cheaply hauled, whether or not it cements ual to another gravel, or anything of that kind? In fact, you ould have to use the material at hand, would you not?
Mr. GOLDBECK. That is very true; but the same thing applies to avel that applies to different rocks in a community. You know, avels from different pits vary in their characteristics. Some avels may be quite clean and lacking in this fine binding material; hers have too much binding material.

Mr. STEELE. The point I was getting at is that [illegible] the parties constructing the road that they would have to use gravel that was economical to handle?

Mr. GOLDBECK. Oh, yes.

Mr. STEELE. They could not go and haul 5 or 10 miles gravel would be of a better material than that which was along the right of way, so that in building these roads is a question of using the material at hand?

Mr. GOLDBECK. Oh, yes. You can consider a concrete mixture as a gravel that is making up the fine binding material that would be out of that kind of gravel. In the case of these tests of various materials we had on that gravel road would produce good pieces. On the other hand, if we had been supplied with we could not quite definitely whether a gravel would make good gravel for road construction. We [illegible] how to treat it, but we would like to see whether it will [illegible] material such as it is.

Mr. STEELE. With the heavy loads they are hauling over a gravel road after a while it will get into pits, but with that information would give them instructions to take another load of gravel [illegible] these little holes and take a large [illegible] and [illegible] would not, so as to keep it rounded up?

Mr. GOLDBECK. Yes.

Mr. HOWELL. Do you have any arrangements in your office [illegible] road experts go out and inspect road material and pass upon it?

Mr. GOLDBECK. The engineers of our construction [illegible] maintenance [illegible] observe these different roads from time to time, so that we are enabled to correlate the behavior of the materials we test and the behavior of similar materials in the road.

Mr. MCLAUGHLIN. But these analyses you speak of, or investigations, are carried on only in your office right here in Washington?

Mr. GOLDBECK. Yes, sir.

Mr. MCLAUGHLIN. The engineers Mr. Howell speaks of, going out to investigate, are not to make such a determination as you would [illegible]?

Mr. GOLDBECK. An engineer could not possibly make determinations of that kind in the field. All these determinations require extensive and quite elaborate apparatus. The machines have to be accurately built, and field investigation of that kind can not be made.

The CHAIRMAN. As a matter of fact, this entire item is for laboratory investigation?

Mr. GOLDBECK. Laboratory investigation; yes.

The CHAIRMAN. Both as to the chemical make-up of the material and the physical make-up?

Mr. GOLDBECK. Yes, sir.

Mr. ANDERSON. What investigation have you made of concrete road construction?

Mr. GOLDBECK. We have conducted experiments relative to the expansion and contraction of concrete in road construction. Just before building the Chevy Chase Road we conducted a number of experiments on concrete columns, and these columns were subjected to [illegible] conditions of moisture. We took very delicate measurements of the column practically every day, or at least at sufficiently frequent

ervals to enable us to see what was occurring, and we found that ler the various moisture conditions the concrete shrinks and ex- ds; that is, as it dries out it shrinks and on being moistened it ands; and we could make it grow or decrease in length, depending n the moisture content—depending upon whether we wet the con- e or not.

hen we conducted similar experiments on the experimental road Chevy Chase. We have bronze plugs set in the road, and we have ually measured the amount of movement of that road. It is an portant problem in connection with certain details; for instance, construction of expansion joints.

Mr. ANDERSON. What I had reference to particularly, however, was ether you had any experience or data with reference to the dura- ty of the road under ordinary traction conditions.

Mr. GOLDBECK. That is a subject that, to my knowledge, has not as been investigated. We have just designed and built an instru- nt for measuring the wear of roads of different kinds under wn conditions of traffic.

Mr. ANDERSON. The reason I asked the question was that we have oad in my district of twenty-odd miles and expected to expend ut $500,000 additional on concrete roads. The experience thus seems to indicate a much greater wear from ordinary traction n was originally thought likely, and I was wondering if you had y experience on that question.

Mr. GOLDBECK. As a matter of fact, at the present time concrete gineers, you will find, are not fully decided as to whether they uld use as the course aggregate of roads hard, tough rock or soft gments of the same degree of hardness as the mortar, or whether y should use rounded pieces of gravel or angular fragments. That int has not been accurately determined, because the concrete type road is too new a proposition.

Mr. ANDERSON. Would you say a concrete road now is an experi- ntal proposition?

Mr. GOLDBECK. The concrete road is just about as much an experi- ntal proposition as some of these other roads. No one knows at e present time the life of a concrete road. In that, it is an experi- ntal proposition.

Mr. OVERMYER. What is your judgment as to the relative merits of nforcing or not in the building of concrete roads?

Mr. GOLDBECK. That comes down to a question of economy. Re- forcing adds to the cost of the concrete road. The purpose of rein- cing the concrete road is to decrease the number of cracks. The ncrete road when built ordinarily—with expansion joints, we will , 30 or 35 feet apart—sometimes develops cracks in between the pansion joints. Reinforcement would cut that down and probably minate the cracks altogether.

Another thing: There are conditions of sub-base that would re- ire reinforcing in the concrete; for instance, the conditions where e moisture in the sub-base will be excessive; conditions——

Mr. OVERMYER. Freezing and thawing excessively?

Mr. GOLDBECK. Freezing and thawing would affect the road under orable conditions. As a matter of fact, freezing and thawing ght possibly cause longitudinal cracks under certain conditions.

Mr. DANIELS. What character of reinforcement would you suggest?

Mr. GOLDBECK. The type of reinforcement ordinarily used is some type of mesh reinforcement—perhaps expanded metal, triangular mesh, or some type of steel reinforcement in the form of mesh; sometimes rods are used.

Mr. CANDLER. Would putting gravel shoulders on each side reinforce it to some extent?

Mr. GOLDBECK. That would not be considered reinforcement. By "reinforcement" we mean putting something in the concrete in the way of steel rods or mesh to care for the tensile stresses developed.

Mr. REILLY. It is used in concrete pavement. They have used both kinds in my town, and I think they are in favor of the reinforcement. It seems the engineers differ. Some say if the road is made level it won't break or crack. That has been the great trouble; it cracks lengthwise and sidewise and almost in every direction.

Mr. GOLDBECK. There are a number of conditions that might cause the cracking of a concrete pavement.

Mr. STEELE. In that case, you put in a filler that fills it up?

Mr. REILLY. They use expansion joints 35 feet apart.

Mr. OVERMYER. Anything you can do to reduce the number of cracks will, of course, make your road more durable?

Mr. GOLDBECK. Yes, sir; at the point where the cracks occur there is a pounding of the edges tending to break them off; but that is pretty successfully taken care of by the use of some sort of bituminous filler.

Mr. REILLY. In certain parts of the country they are using machines for washing the sand and gravel.

Mr. GOLDBECK. Undoubtedly for use in concrete-road construction that will help. It has been pretty definitely demonstrated that in a rich mixture of concrete, such as must be used in concrete roads, a clean sand is a pretty good thing to have. By "clean sand" I mean sand free from small particles of clay. The size of the particles in the sand influences the strength of the mortar. The mortar binds together the coarse materials, the stone, and unless you have a clean sand and a sand in which these small particles are eliminated you are likely to have pretty weak mortar.

Mr. REILLY. Is it not a fact where a great many times concrete streets made up of broken stone have considerable dirt in them?

Mr. GOLDBECK. Broken stone with the dust in it.

Mr. REILLY. Dirt, too—crushed stone.

Mr. GOLDBECK. You are speaking of concrete bases?

Mr. REILLY. Yes; and the top of coarse gravel.

Mr. GOLDBECK. They may be made that way.

Mr. REILLY. Made of granite and cement.

Mr. GOLDBECK. Granite makes a very, very good fine aggregate for use in concrete with cement.

Mr. REILLY. That is what they use to make the top, of about an inch thickness and a 6-inch base.

Mr. GOLDBECK. That makes a very good wearing surface and resists wear.

Mr. MCLAUGHLIN. In Wayne County, Mich., the county Detroit is in, I believe every country road from the city limits to the county line is of concrete. It would seem to me that that would be a good place to make investigations to learn what the wear is and what the influence of the climate is. Of course, there is very heavy traffic

ver several of those roads—all kinds of traffic. Nearly everybody p there has an automobile, and besides there are all kinds of other ehicles, and the climate is such that it would seem to me it would ffer opportunity to make investigations as to the results of the emperature. We have very warm weather and again pretty cold eather, and their roads have been built long enough so that it ould seem to me that the results of an investigation up there would e valuable.

Mr. GOLDBECK. That is very true. As a matter of fact, we, as I ay, have designed and built in the office an instrument to make such nvestigations.

Mr. MCLAUGHLIN. How long have you had that?

Mr. GOLDBECK. We have had the instrument, I should say, about vo months. We have not done anything with it yet, but it has ist been built for that purpose and will be put into service within few weeks.

Mr. MCLAUGHLIN. You may have a better place to make the in-stigation, but it occurs to me that that would be a very good place make such investigations as you speak of and as I have in mind.

The CHAIRMAN. I wonder if this would not be a good place to in-uire of these gentlemen the reason for the additional appropria-on asked here? The note says that "this amount is desired in der to adequately prosecute the work on concrete now under way." would like in this connection to have that explained. Capt. Wilson, you desire to present it or Mr. Goldbeck?

Mr. WILSON. Please do so as briefly as you can, Mr. Goldbeck.

Mr. GOLDBECK. This concrete investigation is a very important one. here are bridges built in connection with roads—culverts, and idges over streams of larger size. Running over these bridges, e have heavy, concentrated loads—we will say a load due to a road oller.

About two years ago the engineers of the office, in attempting to et out a rational design for such slabs and bridges, found there was ot a single thing in engineering literature that would tell them bout it, and every engineer was using his "horse sense," his judg-ent, in designing flat slabs subjected to concentrated loads. Ob-iously, then, every engineer was playing on the safe side. He was esigning structures too strong. Thousands of these culverts and idges are being built, and it will be a great saving of money if we an determine how to design such structures rationally, and for that eason we are making investigations on slabs subjected to concen-rated loads.

Let me illustrate: Suppose that this paper represents slabs and ny arms are the supports. Suppose I put a load right here in the enter. It deflects in the center, but it is not deflected on the sides uite as much. The question is, how are we going to design such slab to take care of such a load? To get at any reasonable basis or such a design, we must make investigations to determine how the tress distributes itself all over the width of the slab.

Mr. CANDLER. The great railroad systems are adopting these con-rete culverts. I know the Illinois Central Railroad in my coun-ry is putting in concrete culverts all along their lines.

Mr. GOLDBECK. Exactly. But in the case of railroads, you will ind, as a rule, that they have deep earth filling on top, and the load

is not concentrated as it is in the case of highway structures. T filling distributes the concentrated load out, and by the tim reaches the structure it is a uniform load, or more or less so.

Mr. McLAUGHLIN. One of the counties in my State (I know only one which comes to my personal attention) in building culv constructs them a few inches below the surface of the road, then they build the road over that culvert and across that dep sion, just exactly as they built the rest of the road. That may a in supporting and strengthening the culvert; and it certainly away with the bumps and jolts at the end of the culvert.

Mr. GOLDBECK. Yes; they are built that way, and this filling more or less distribute the load. That is another one of our probl as a matter of fact.

Mr. HELGESEN. But that would not take care of the concrete r where the culvert had to be built with the concrete road, bec there is no possibility of putting dirt on top of that.

Mr. McLAUGHLIN. Yes. Build the floor of the culvert or s bridge, say, 6 or 8 inches, or make it more, below the general face of the road, and then the road is built across those culverts exactly as the rest of the road is built.

Mr. OVERMYER. It is done primarily to give a level surface?

Mr. McLAUGHLIN. Yes. The gravel or stone which binds toge has some strength of its own and is laid of uniform thickness r over the top of the culvert.

Mr. HELGESEN. But if you build only a dirt cushion between road and the culvert, and that cushion works out, where does road go to?

Mr. McLAUGHLIN. It would not do that if properly constructe

The CHAIRMAN. How many men have you engaged on this w

Mr. GOLDBECK. We have at the present time four men.

The CHAIRMAN. And you want four more?

Mr. GOLDBECK. We want four more, in order to properly pros the work. This work is comparatively new in the office. It begun about, I should say, three or four years ago, but it was ducted in conjunction with the road-materials investigations. W we want to prosecute it in the way it should be prosecuted.

The CHAIRMAN. You want to go out into the field?

Mr. GOLDBECK. To some extent, that will have to be done.

The CHAIRMAN. You feel that the development in concrete-building and bridge building has gone far enough so that a t ough investigation of that subject is needed?

Mr. GOLDBECK. There is not the slightest doubt about that.

The CHAIRMAN. And that you need four more men in ord prosecute that and come to some conclusion about it?

Mr. GOLDBECK. Yes, sir.

Mr. REILLY. You mean the common, ordinary trouble they having with roads as to how to build them?

Mr. GOLDBECK. I do not mean any trouble with respect to ho build them, but I do say there is uncertainty in the design, in they are not able to design rationally. They do not know just stresses are existing on these culverts, and for that reason they playing on the safe side.

Mr. McLAUGHLIN. They make them more expensive than n sary?

r. REILLY. Up in my section of the country for every large span have steel-enforced culverts and they do not have any difficulty ll. Whether they put in a half inch or an extra inch, it does not much.

r. GOLDBECK. In the aggregate, if everybody in the country is g that, it would amount to quite a great deal.

r. REILLY. The people up in my State are not considering the ert question, but they are very much interested in the question of lurability of the concrete road itself—how to construct it so that ll resist weather conditions.

r. GOLDBECK. That is all a part of the investigation. We have r way tests for determining, for instance, the proper thickness ncrete bases. We know that the wheel loads are increasing every . We are using heavier and heavier trucks, and for that reason ty soon we are going possibly to need increased thickness of rete bases.

r. OVERMYER. You were speaking of railroad bridges and ordi- road bridges. Is it not a fact that the stress per square inch some- s on the farm road bridge is heavier than on a railroad bridge, eason of the fact that the rails and ties distribute the load of a ing train, and that there is less stress per square inch there than is under a farm wagon on a country road?

r. GOLDBECK. That may be true. Of course, it depends entirely ie design.

r. ANDERSON. How many different kinds of experiments do you ct to conduct under this item?

r. GOLDBECK. We have outlined here eight experiments.

r. ANDERSON. I think oftentimes in legislation the tendency is read these investigations out among so many subjects that when come to look for the results of one of those experiments you can ind them. They are like the Irishman's dinner, "So fine you can ee it."

r. GOLDBECK. The trouble with certain investigations is this: rete takes a long time to set, and unless we have a number of riments under way at one time we do not get much done. We conduct a number of them at one time in order to get any work .

r. ANDERSON. Then, this appropriation would have to continue a considerable number of years before you possibly could get definite results?

r. GOLDBECK. Yes. I feel that is so, in some cases. In some we will get results pretty soon. For instance, in the slab inves- ion I feel that by the end of the year we are going to have ts that will enable engineers to design rationally.

r. ANDERSON. I think the most important investigations that be made in the matter of concrete involve the durability and ral efficiency of the concrete road. A good many of the ques- involved in concrete construction in the matter of bridges and erts and propositions of that sort have been worked out by ate companies. Most of that work is done under contract by neering firms, but road construction is done very largely under rent conditions, and it does seem to me that that line of investi- n is the most important that can be undertaken under this item.

[illegible]

The committee resumed [illegible]

STATEMENT OF MR. P. ST. J. WILSON, ASSISTANT DIRECTOR OF THE OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING—Continued

The CHAIRMAN. Now, Capt. Wilson, take up item 45, on page 184 of your Book of Estimates, and tell us about that. Before you do that, however, I would like to read into the record at this point a letter from the Secretary.

WASHINGTON, D. C., February [illegible], 1916.

Hon. ASBURY F. LEVER,
Chairman Committee on Agriculture, House of Representatives.

DEAR MR. LEVER: In connection with the estimates of appropriation for the Department of Agriculture for the fiscal year ending June 30, 1917, I have the honor to invite your attention to item 45 appearing on page 184 of the Committee Book for field experiments, $90,000, and request that the following new language recommended therein be omitted: "Conducted upon experimental roads constructed by the Department of Agriculture and upon post roads constructed under the act of August 24, 1912," and that the following old language be restored: "Confined as nearly as possible to one point during the fiscal year." The restoration of the old language is requested by the office of Public Roads and Rural Engineering, as the new language recommended in the estimates will not accomplish what is desired by that office.

The paragraph as amended will be the same as in the appropriation act for the fiscal year 1916, reading as follows:

"For conducting field experiments and various methods of road construction and maintenance, and investigations concerning various road materials and preparations, for investigating and developing equipment intended for the preparation and application of bituminous and other binders; for the purchase of materials and equipment, for the employment of assistance and labor, and the erection of buildings, such experimental work to be confined as nearly as possible to one point during the fiscal year (same acts), $90,000."

Respectfully,

D. F. HOUSTON, *Secretary.*

Mr. WILSON. I may say in explanation of that, Mr. Chairman, that when this new language was suggested to be put in here it was our intention to have it confined to maintenance only. This item as it stands in the current appropriation act provides for both construction and maintenance. By some oversight the word "maintenance" was left out of the new language, which would make

t the purpose was to reconstruct roads which had just
ructed, whereas our purpose was to conduct maintenance
Some increase was recommended for the experimental
e of post roads when the suggestion for change in lan-
first proposed; but, in view of the fact that it was thought
keep the appropriations at the minimum, that increase
t-roads maintenance was stricken out. Hence, there will
ion to have new language in the item, and the appropria-
s actually to cover the work we have done heretofore;
e construction and maintenance of experimental roads,
und the city of Washington, as in this vicinity the work
ntenance of those same roads can be watched. This fund
the construction and maintenance of experimental roads,
nents in the use of materials that have not been demon-
proper road materials, and for comparative tests of dif-
s of road materials.
IRMAN. That is item 45?
SON. Yes, sir. For instance, we have a road 4 miles long
xandria County, Va., on which we have 19 different mixtures
s along a road where there are practically no branches to
anything, and we have exactly the same conditions at one
that road as at another and are able to try out, in that
of these combinations. That is the work we are doing
tion, and we are using experimental methods in maintain-
oads.
IRMAN. Would you like the committee to hear any of your
n that?
SON. Not unless the committee desires to go more into

GESEN. Have you any statistics to show what proportion
s of the country are and always will have to be dirt roads;
re it is not economically possible to build other than earth

SON. We are making up now and will have ready pretty
ublication a bulletin on the subject of road mileage and
This will be for the third of the three five-year periods. We
rst in 1904, again in 1909, and then we started out in
s publication will cover what was done in 1914; but we
egin to get the statistics until after the end of the year
have now gotten practically all of those statistics and are
m formulated, and that bulletin will give the information
r every county in the United States. We have one now in
1 form. We have the bulletin containing the statistics
nd another one for 1909, and this last one will contain
ormation through 1914.
GESEN. Without any detailed statistics, but just roughly,
ortion of the roads of the county do you think are and
be for all time dirt roads?
SON. It has been estimated that from 80 to 85 per cent of
of the country is carried on less than 20 per cent of the
my judgment, that 20 per cent will cover most of the
oads that carry the 80 per cent. Beyond that there will
ratively small amount of roads which will be anything
dirt roads, or gravel construction, for a long time to come.

Mr. HELGESEN. You mean that 80 p
country will have to be carried on dirt
Mr. WILSON. No, sir; I say 80 per
carried on 20 per cent of the road mile
mudholes, and this 20 per cent of the
to be surfaced. I do not think we wi
time.
Mr. HELGESEN. You are talking ab
think you must be entirely off in your
scientific facts. Take States like Nort
ota, Minnesota, and all of those Stat
where the gravel is tremendously expe
sands of square miles in our State whe
ages by buying it at so much a cubic ya
distance.
Mr. WILSON. The dirt road is the on
a long time to come.
Mr. HELGESEN. And yet in our State
million bushels of wheat, all of which h
and we raise half of the flax of the U
barley crop of any State in the Union.
or was last year, and that creates an e
not believe that 85 per cent of the traf
of the roads. It does not seem possible
Mr. WILSON. That is the average, of c
be more or less.
Mr. HELGESEN. I am talking about t
Mr. WILSON. Do you recollect those
Mr. JAMES. The estimate was made e
to say that 90 per cent was carried on 10
Mr. HELGESEN. On what basis do you
Mr. JAMES. By taking the ton mileage
Mr. HELGESEN. Take the great agricu
the shape of tonnage, and what is there
all that bulk has to be hauled over dirt
that approaches it at all in this countr
Mr. WILSON. Not any one thing, but
Mr. HELGESEN. The manufactured pr
to be carried over any kind of roads, ex
Mr. WILSON. Except in the distributi
ucts have to go back over the roads fr
come, but on a very much smaller scale
Mr. HELGESEN. Here is the answer to
100 or 200 tons of wheat, and he brings h
factured products. He does not care a
the road when he is hauling his manufa
he does care about is the quality of the
products to the market. And if you
manufactured products have practically
for good roads, because, as I say, they
at various times.
Mr. WILSON. Yes.

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ILGESEN. It does not make any difference how poor the roads
hauling the manufactured goods home; the only difference
is in hauling the products to the market. And if you take
of it, I think you would have to reverse your figures.
MES. Those figures were taken from the census reports, I

ILGESEN. They say figures don't lie, but sometimes they do,
nendously.
AUGEN. I understood you to say that dirt and gravel roads
e most practicable for some time to come. Are we to under-
t dirt and gravel roads will answer the purpose for a while,
or all times, for some localities?
ILSON. I say, for the large proportion of the mileage the
the country, in my judgment, will always be dirt or some
ap surfacing material.
AUGEN. What construction do you suggest, for instance, in
nnesota, and the Dakotas?
ILSON. A gravel road, or a dirt road where the traffic does
y a gravel road. Where you have gravel within reasonable
listance, either by rail or by wagon, I should say that that
t class of road construction, certainly, in a country where
gravel immediately contiguous to the road or within a
e distance for a wagon haul.
ILGESEN. But when you have to pay a dollar and a half a
d for gravel and then have to pay the freight on it, you see
impossible proposition.
ILSON. That is impossible, except for a heavy-traffic road;

AUGEN. With gravel at a dollar and a half a cubic yard, the
irt road with a gravel surface does not begin to compare
cost of a surfaced road?
ILSON. Not for the cost of concrete or anything like that.
AUGEN. What would you suggest doing with the roads in
of the prairie country?
ILSON. I would say dirt roads or roads of some cheap sur-
aterial, except where the traffic is heavy.
AUGEN. Now give the process. First, what?
ILSON. The most essential feature of any kind of a road is
nage.
AUGEN. First is drainage; then what?
ILSON. Take the water first off the road to the side ditches
away from the side ditches as frequently as you can.
AUGEN. Next?
ILSON. Next to that is the keeping of them in proper shape
the traffic.
AUGEN. To grade?
ILSON. Yes; and see that it is well drained.
AUGEN. And keeping it rounded up?
ILSON. Keeping up the crown is one thing and keeping out
ooves, wheel ruts, and round holes, and frequently going
or this purpose is an advantage; then building culverts to
water under the roads instead of having to ford streams.
AUGEN. And next?

[illegible]

Mr. [illegible]

Mr. [illegible]

[illegible]

Mr. [illegible]

[illegible]

Mr. [illegible]

[

ike roads without the gravel, and everybody knows how essen-
ıe gravel is in order to make a road—either gravel or burnt
And it occurred to me that possibly you might have discovered
ıew material for covering that type of road.

WILSON. No, sir. Answering Mr. Helgesen's question, we have
ntly found that we could either help the people in the manner
ich they were doing it, and in an economical way to advise
ıs to the proper machinery which they probably did not have
—more economical machinery or more economical methods of
ng the road construction.

far as the dirt road is concerned, the whole point in building
road is to get the road so that the water will run off the road
ıen to have the ditches so constructed as to carry the water
from it. That is all that reasonably can be done—the proper
ge and the crowning of the dirt road. One improper method
ile the soil up in the center of the road and do nothing more

next thing to be done is the surfacing. That consists of getting
ıterial there and putting it on. There are a good many ways
ch that can be done and a good many suggestions which can be
to those people so that they can handle it in a more economical
r.

HELGESEN. Speaking of a more economical manner, do you
of any machinery that can be used which is better than the
nery now on the market for use in road making of various
There may be a difference in the efficiency of the various
graders, but they are all on the market and of course it is a
of choice; but do you know of any other method of handling
ept by using the grader, which will make it more economical?

WILSON. No. If you first go along with a grader, then pack
ad so as to get it in suitable shape, and then use the drag to
t in shape, that is the most economical way of building dirt
Then the ditches and the drains must be kept open so that
ıter can get away from the road.

HELGESEN. We have discovered, and I presume you have dis-
d, that in using the grader, for instance, the essential thing is
p the sides open and then to drag the top of the road and to
up a high crown, and to keep it from leveling down and pack-
And then the first thing you know it will be all full of holes,
e fill them in and try to keep packing the road from the time
arted until it is finished, so as not to give it an opportunity for
g unevenly afterwards.

WILSON. I have frequently seen men who had been working
practically all their lives take a grading machine, go down the
ınd pile the stuff consisting chiefly of vegetable matter, in the
ı of the road, and make the road a great deal worse instead of
Of course, a suggestion to a man doing a thing of that kind
th a good deal. We have been able in a great many instances
ke suggestions which have stopped people from doing things
t kind. I just mention that one instance out of many.

HELGESEN. The great trouble with that is that they do not
nstructions so much as to follow the information we already

Mr. RUBEY. The main thing, after all, is not only the machinery but the power you are going to apply to that machinery. A long time ago they used to go out and cut a road with a plow and a scraper; but if you go out to build a road to-day with just simply a plow and a scraper and put on four horses to the grader, you are doing very much like they used to cut wood. But if you go out with a great big engine that will go ahead and make the road just as fast as it goes in that smooth, level country, you can make the roads rapidly, and you can make four or five times as much road in a day as in the old way.

Mr. WILSON. But the machinery, like the material, depends a great deal on the problem you have to deal with.

Mr. HELGESEN. Can you put in the record how you figure out that 80 per cent of the traffic can be carried on 20 per cent of the roads?

Mr. WILSON. The estimate that 80 per cent of the traffic is carried by 20 per cent of the roads is based partly upon deductions drawn from mass figures and partly upon observation in specific counties. I might call your attention to the fact that there are in the United States about 2,250,000 miles of public road, which, averaged among the 3,000 counties, would mean 750 miles of road per county. Excluding the arid and sparsely inhabited sections of the United States we may conservatively state that the average county has an area from 600 to 700 square miles and a road system of approximately 600 or 700 miles. Now, if we assume a market road system radiating from the market centers and shipping points of the county that can with 150 miles of road, serve an area extending back at least 2 miles on each side of the road, or 4 square miles of area for each mile of road, the system of 150 miles would serve practically the entire trade needs of a county having 600 square miles of area. As a matter of actual fact it would serve a larger area, or a smaller improved mileage would serve the same area, as there are very few counties which do not have some particular section that is unproductive and needs very little in the way of transportation facilities. Thus, while theoretically 25 per cent of the road mileage will serve all of the traffic needs except that which is purely neighborhood in the smallest degree, in actual practice usually 20 per cent will accomplish this purpose.

Substantiating this generalization with specific instances, we rarely find that a county of average size has, after completion of its market road system, exceeded 150 miles of improved roads, and unless exceptional conditions prevail we rarely find the percentage of the total exceeding 25 per cent. During the past five years we have had occasion to make most careful studies of the effects of road improvement in eight selected counties, making our studies from year to year to note the relative benefits and burdens accruing to the counties by reason of the road improvement. In six of these counties we have been able, by careful inquiries of merchants and producers, freight agents at railway stations, and by traffic counts on the roads, to ascertain approximately the tonnage of products hauled on the improved roads and the proportion of that tonnage to the total for the county. I will give you a few examples from these counties as follows: In Spotsylvania County, Va., about 95 per cent of all traffic passes over 21 per cent of the roads; in Lee County, Va., about 80 per cent of the traffic passes over 10 per cent of the roads; in Dinwiddie County, Va., about 95 per cent of the traffic passes over

of the roads; in Dallas County, Ala., about 84 per cent
er 20 per cent of the roads; in Wise County, Va., about 90
of the traffic passes over 27.6 per cent of the roads; in
ıle County, Miss., about 50 per cent passes over 12 per cent
ads.

ıave already shown, a system of market roads can be so
s to leave no point more than 2 miles distant from the main
oad and still not require the improvement of more than 20
of the total mileage. Naturally, when I speak of the per-
ıf traffic passing over the improved road, I do not speak of
iginating on the improved road but rather of the relative
ıge, meaning tons multiplied by length of haul passing over
ıved roads as compared with the unimproved roads.

AUGEN. My object in asking the question as I did is to ascer-
ossible, the policy of the department as to road building—
e of road it proposes or suggests to build. As you know,
e bill passed by the House the other day every project will
e O. K'd by the department.

ILSON. Yes, sir.

AUGEN. And under that bill it will be possible for the de-
to dictate what type of road shall be built. For instance,
nany believe in a gravel and clay road, and there is no ques-
y mind but that it is the most practicable road. Now, sup-
county should suggest the building, say, of 10 or 100 miles
they would have to come here to the department and secure
rtment's approval; it would be for the department to say
such a type of road should be built or not. If the depart-
not approve of that type of road—a gravel road—and
fuse to approve that project no money could be appro-
or that project.

ILSON. Possibly the best answer I can make to that, Mr.
is that the matter was thrashed out quite thoroughly here
ning about what has been done in Iowa. Under the 1912
ation for the Post Office Department, providing for the
of post roads in cooperation with the Department of Agri-
wo roads have been built in Iowa, one from Boone to Story,
e of 45 miles, at a cost of $43,000. There was no material
to surface that road, and we built a dirt road with no sur-
ı it. The other road was from Dubuque to Dyersville, in
se gravel beds were situated about a mile from the road,
gravel was put on the center of the road. Those are the
s that the department has built in Iowa under that appro-
which you might take as a sample of what we might do if
ı larger appropriation. That policy, of course, has been
throughout the country, and we have built largely, and
y entirely, the class of road that was wanted by the people
the money to put up. That is the course the department
wed in the use of that post-office appropriation, and that
gestions to counties and States when they have asked for
to what kind of roads the people should build, whether in
an object-lesson road or a county system of roads. And
ur time is given to that class of construction and more of
y has been used in the employment of men to look after that
he higher grades of work. I think that is probably due to

the fact that most of the States [illegible] of work have gotten to [illegible] handle their own work. We [illegible] much as we are in the more [illegible] have less money to spend and [illegible] work as the States with the [illegible] that must be most of our [illegible] the earth and gravel road.

Mr. Hayden. What I [illegible] the suggestion and the program [illegible] of the States will be approved [illegible]

Mr. Wilson. Yes; but I [illegible] lately the idea of the department [illegible] ters have to come from the States.

Mr. Hayden. I am very glad to [illegible] standing has been that the department [illegible] that it has been partial to the more [illegible] would be a practicable thing to do [illegible] I do not believe it would be a very [illegible] of the State.

Mr. Wilson. I think if you knew the [illegible] done in Iowa you would be satisfied that [illegible] of the department in recent years certainly [illegible] noted with it.

Mr. Hayden. The reason I asked the question I [illegible] count of the road bill that was passed by the House [illegible] The question will come up as to the character of [illegible] are entitled to a division of the money. Now, I [illegible] are the proper men to determine what will be acceptable [illegible] there are large territories where only a dirt road is possible. I [illegible] that they will accept that, if it is well built, as being a proper [illegible] on which to spend the Federal money.

Mr. Wilson. That is my understanding.

Mr. Hayden. If it is not, we never could get any of the money of the Government.

Mr. Wilson. That is my understanding of the policy of the Department. The suggestion was made, I think, by the Association of State Highway Officials in connection with a bill which probably some of you gentlemen have seen, which was formulated by them and generally circulated. The Secretary, in his annual report for 1914 stated that if direct Federal aid is to be expended the emphasis should be placed on the community road, on the necessity of improvement in an economical manner of the dirt roads of the country, particularly through the cheaper forms of construction, such as sand-clay, gravel and earth.

Mr. Hayden. It is safe to assume, then, that the character of road suggested by Mr. Helgesen would be acceptable to the department?

Mr. Wilson. I think so.

Mr. Hayden. Roads that are simply graded and drained and without surfacing, by gravel or otherwise.

Mr. Wilson. If the initiative comes from the States, and they say they want it, I am satisfied the department will approve it.

Mr. Howell. Some of the counties in my State keep their roads well sprinkled and others do not.

Mr. HELGESEN. With water?
Mr. HOWELL. With water. Have you made any investigation, de from the general comfort of those who travel those sprinkled ıds, as to the benefit in the maintenance or keeping up of the roads ıt comes from sprinkling?
Mr. WILSON. What class of roads are those?
Mr. HOWELL. Earth roads.
Mr. WILSON. In what section?
Mr. HOWELL. Logan, Utah, for example.
Mr. WILSON. Yes, sir; I think that is a great help to keep the ıd, you might say, from blowing away; and the hauling, of course, the road itself, compacted by the water, is very much easier and ı can haul a bigger load than you can on that road during the y season when the road is knee-deep in dust.
Mr. HOWELL. So, from the standpoint of economy—not taking o consideration the general comfort of those who travel—it is lly economical to sprinkle the roads?
Mr. WILSON. I would say yes, leaving out the question of how ch it cost to sprinkle, what the traffic on that road is, and how ch you are going to save. If you carry only one load a day over road, and if you are going to spend a great deal of money to inkle it, it would not be a paying proposition. The conditions of ffic and many other things have to be taken into consideration determining whether, as a dollars-and-cents proposition, it is ofitable, but that is a good method of keeping the roads in repair. ey do that in some of the other States, as, for instance, down in southern part of California.
Mr. HOWELL. For roads that are frequently traveled—the ordinary ıntry roads—it is a real economy to sprinkle the roads, besides oducing greater comfort?
Mr. WILSON. That is the first effect of it; yes; and then it pre-ves the road and keeps it from getting so deep in dust as to make ıvy hauling there.
Mr. HAUGEN. Sprinkling with what—water?
Mr. WILSON. With water.
Mr. HAUGEN. Can you give an estimate as to the cost per mile of ing roads?
Mr. HELGESEN. In that connection, I was just wondering if you ve determined how much they can afford to pay per barrel for ıde oil, or anything of that kind, and be able economically to use on the road. The reason I ask the question in that form is that may cost very little in a section of the country where freight is ap; but where they haul the crude oil for 2,000 miles it becomes expensive that it would not be economical to use it. If you can termine how much they can afford to pay per barrel for that ıde oil, then they can determine for themselves whether they can y at your price or not.
Mr. WILSON. There is another side to it, and that is how much is it rth on that road? For one road they might afford to pay a great ıl more than for another road; so that, in order to get at it, you ve to take into consideration its worth on the particular road.
Mr. HELGESEN. Take the kind of roads we have, that are being proved over a black loam, and I would like to have you put into

Mr. HUTCHESON. I am getting the same kind of traffic?

Mr. WILSON. That is what I mean. Of course in order to [illegible] the traffic and the cost of [illegible] per mile. Therefore, the cost of [illegible] from 800 to 3000 per mile. There are [illegible] which it would not be economical to spend [illegible] money, while there are some on which an expenditure of [illegible] would be justified.

Mr. HUTCHESON. Then, there is no way of finding out whether any [illegible] economical proposition except for the community to experiment for themselves?

Mr. WILSON. That is, you have at least got to know what the traffic is and the traffic conditions, and things of that sort.

Mr. HUTCHESON. You know perfectly well that the farmers can not afford [illegible] road where there was not a great deal of traffic. It

uld be the main road. But what they do want to know, and what
y will have to know either from your office or by their own ex-
sive experiments, is whether or not it would be an economical
ctice to use those things.
Ir. WILSON. I think I can get you some information that will be
ervice to you.
Ir. HAUGEN. Would not a statement giving the number of bar-
of oil required to oil a mile of road and the length of time it will
—would not that answer your question?
Ir. WILSON. And the primary cost of the oil?
Ir. HAUGEN. Yes.
Ir. HELGESEN. That would give you the cost of oiling the road.
the question, then, is, Is it an economical proposition to use it in
a case?
Ir. HAUGEN. The next thing is, how long it will last and how
ny carpets it will destroy? I take it that they could not estimate
damage caused by oil being tracked over the carpets and all over
house.
Ir. HELGESEN. Suppose you had a road to treat and you could buy
t a dollar a barrel, and you find it is an economical proposition;
nother place they have to pay $3 a barrel, and it would not be an
nomical proposition. Now, if they can determine that through
r experiments, it will save every community in the country from
ing to find that out for themselves.
he CHAIRMAN. I take it that they can determine that if they
w what the traffic is on the road and the character of the road.
Ir. WILSON. That is the idea; yes, sir. Then we can tell whether
ill pay or not; but you have to know what the other side of the
blem is—how many people are going to benefit from it, etc.
Ir. LEE. And you could not tell how long that road would last?
Ir. WILSON. No; except by observation.
Ir. HAUGEN. Does the oiling last beyond a year?
Ir. WILSON. Not on that kind of a dirt road.
Ir. HAUGEN. You know the price of oil in any section of the
ntry, and, as I understand, the road has to be oiled once a year.
Ir. WILSON. Yes, sir; once a year.
Ir. HAUGEN. And what is the expense per mile?
Ir. HELGESEN. That depends on the section of the country.
Ir. HAUGEN. Take it right here.
Ir. WILSON. You mean for a light oil treatment?
Ir. HAUGEN. Yes; a sand road, for instance.
Ir. JAMES. Mr. Reeve estimated it at 9 and 10 cents a year for
eated applications.
Ir. HELGESEN. Per square yard?
Ir. JAMES. Per square yard for the repeated applications.
Ir. HELGESEN. Ten cents a square yard. What would that rep-
nt as the cost per barrel of oil?
Ir. JAMES. With crude oil, about 2½ or 3 cents a gallon in some
ces and perhaps two or three times that in other places, depending
the freight.
Ir. HELGESEN. It would not cost the same amount—10 cents a
d—where they are paying freight of 3 cents?
Ir. JAMES. No.

Mr. HAUGEN. Can you state the number of barrels required to oil a mile of road?

Mr. WILSON. That depends on the width of the road. There are 7,040 square rods of road in a mile of road 10 feet wide.

Mr. JAMES. For a 16-foot road it would be about 4,420 gallons per application.

Mr. HAUGEN. And what is the price of the oil?

Mr. JAMES. Two and one-half cents; 3 cents is a good price for it.

Mr. HELGESEN. Where?

Mr. JAMES. Along the eastern seaboard here, for instance. It varies with the freight rates to different parts of the country.

Mr. HELGESEN. And when you are going to build 2,000 miles in the interior you will have another proposition.

Mr. WILSON. That is what I said this morning.

Mr. RUBEY. Before we leave this proposition I would like to say this: I am reminded of the poem about the little girl who had a curl right in the middle of her forehead, and when she was good she was very, very good, and when she was bad she was horrid. That can be applied to a dirt road.

Mr. OVERMYER. One other thing, Mr. Chairman, that has not been brought out is the effect of oil on the automobile tires.

Mr. HELGESEN. The Standard Oil Co. says there is none.

Mr. WILSON. They allow us so few automobiles that the department has not been able to experiment.

STATEMENT OF DR. SAMUEL FORTIER, CHIEF OF IRRIGATION OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

The CHAIRMAN. Take up item 46, your irrigation investigations.

Mr. WILSON. The work on irrigation and drainage, as you know, has recently been transferred to this office. In the matter of irrigation I am going to ask Dr. Fortier, who has been in charge of the irrigation investigations for a number of years and who came to this office with it, to go over that work.

The CHAIRMAN. Doctor, I am going to ask you to give us, in a rather general way, what you are doing on this item, and then, if you want to amplify that a little more, I would be glad to have you do it. But we are very anxious to get along with this bill, and we have spent the whole morning here on this roads proposition.

Dr. FORTIER. I shall try to give you, Mr. Chairman, in a few words a statement of the scope and extent of this work.

In the first place, I would like to say that there are being irrigated in this country at the present time about 15,000,000 acres of land. Out of that total about 5 per cent is being irrigated by the two services, the Reclamation Service and the Indian Service; that is, the various projects of the Reclamation Service, of which there are [illegible], and the work done for the benefit of the Indians would [illegible] about 5 or 6 per cent of the total. Our field is the 94 or 95 per cent. The work of the Department of Agriculture in irrigation investigations covers that entire field. And I may say, further, perhaps, that fully 75 per cent of all irrigation development has been done by the farmers or is controlled by groups of farmers under various cooperative organizations; so that the scope of the work is not confined

o the irrigated farm but extends back to the stream. We have to over the work of conducting the water from the stream or source of upply through the various ditches and canals, and also the structures, delivery gates, measuring devices, as well as its application on he various individual farms.

We have also to do with the pumping of water from underground ources and the building of farmers' reservoirs, all of which come nder this one item.

A characteristic feature of this work from the beginning has been ts cooperation. When Congress gave us a little appropriation of 10,000 away back in 1899, I think it was—something like 17 years go—it was with the understanding that it would be used in cooperation with the western experiment stations, and that feature has been permanent characteristic of the work ever since. In the State of California, for instance, we have been cooperating for more than dozen years, and I think that California alone and its various nstitutions and communities have contributed about $130,000 to this vork. In the State of Utah the cooperation has extended over about he same period—12 years. In Colorado to-day the State is putting p dollar for dollar with us, about $6,000 being appropriated anually by each party.

In this work, I may say that the direction and supervision rest argely with the department employees. The work is very carefully utlined. In the case of California, for instance, the director of the xperiment station and his staff go over the work for the ensuing ear, and then it is also sent to the State engineer and his bureau, vho examine it carefully, as well as the men connected with our orce. And with the plans so carefully made the work—that is, the xecution of the work—is handed over to our man.

As you can see by the work of last year, it is divided up into a umber of different headings, although I may say that there is not very clear distinction between the work done under these various ines. The first is the supervision. The territory is wide, and a arge amount of traveling expense is incurred in going from place to lace in supervising the work. Then our men are pretty busy in he summer season in the preparation of their reports, so that the eports reach us in a rather rough state and have to be gone over and ll computations checked by the Washington office. That item, as ou see, amounts to $16,545, of which $2,200 is spent for extension ork. That extension work refers to replies to correspondence. man will write in and ask how he can best build a reservoir, or inall a pumping plant, and we endeavor to give him the best possible dvice in doing such work.

The CHAIRMAN. Your next project is "utilization of water in rigation."

Dr. FORTIER. The main feature under that project, for which 3,360 has been estimated, is to prevent waste.

Mr. HELGESEN. Before you advise some men as to how to construct pumping station I suppose you carefully consider the character of ie water. I have known people to go to that expense only to find iat the water they got was detrimental and could not be used peranently.

probability that will suffice.

Mr. Hayes. If two-thirds of that is wasted, then he w
benefit, and that would not be enough for t

Dr. Fortier. In delivering water in an earthen ditch a la
amount of water is absorbed along the route. We have made hu
dred I was going to say thousands—of measurements of los
all kinds in canals, and the general conclusion reached is that ab
30 or 40 per cent of the water taken from the streams is lost alo
the route.

Mr. HELGESEN. That would be a matter for the irrigation company, in case they sell their water; but how much do you think is wasted after the farmer gets it.

Dr. FORTIER. That depends upon a great many things, but probably the chief of these is the value of the water. If the water is valuable, then they take care of it, as they do in southern California; but if it has very little value, then they follow wasteful methods.

Mr. HELGESEN. But if a man can only get what he pays for—24 inches—it must be valuable; and is there any system by which you can instruct the farmers where they can make such a use of it as not to lose too large an amount?

Dr. FORTIER. That has been our object for years—to try to improve the practice.

Mr. HOWELL. The main loss to the farmer is in using more water than is necessary to produce his crop. Is not that so?

Dr. FORTIER. Exactly. Irrigated farms resemble a vessel. Soil will only hold so much water, and if you put too much on then you simply allow it to percolate through to the bottom. You have then another problem on your hands—one of drainage. The waste water will find the lowest level and will have to be removed by drainage. So that in this work of preventing waste and encouraging a more economical use of water we are really accomplishing two useful objects. It is the case of an ounce of prevention which is worth more than a pound of cure. We not only produce larger yields, but, as a rule, we prevent waterlogging and save the cost of drainage.

Mr. HELGESEN. Where the fields slope, and you have to consider locating the irrigation ditch in a big field in order to get the water down to the lower end of the field, necessarily you will get a great deal more water on the upper part of the field than you would on the lower part?

Dr. FORTIER. Yes; that is true. At Riverside, Cal., according to our experiments, the water went down 23 feet at the upper end of the furrow, and before the 600-foot limit was reached (the tracts there are divided into 10-acre tracts, as you know) it only moistened the soil to a depth of a few feet. So that there is unequal distribution, and that is one of the causes of waste that we are endeavoring to rectify.

The CHAIRMAN. All right. Take up your next work, "pumping for irrigation."

Dr. FORTIER. The water for pumping, as a rule, is not obtained by the large company, such as the gravity canal; but that development has been made very largely by the individual farmer. And there has been a wonderful development since the last census was taken in 1910. In California, for instance, in 1910, they had only something like 10,000 pumping plants. Now our man estimates the number at 25,000. In the rice belt, as some of you know, about 25 per cent of the water that is used on 750,000 acres is pumped from wells, and about 95 per cent of the total amount of water used on 50,000 acres of rice in the Gulf States is elevated by pumping plants, so that you see, even in that comparatively small corner of the country, there has been a wonderful development by pumping.

Our office has also been in a way responsible for encouraging irrigation in the humid regions. We have not been able to do very

[illegible] the Mississippi Valley, simply a [illegible] The rainfall there seems to [illegible] and our experiments at Ames [illegible] other Mississippi Valley States, have no [illegible] The rainfall is two principal [illegible] of it might, then [illegible] irrigation. One of the [illegible] Tennessee [illegible] and in the [illegible] the State of New Jersey there are [illegible]

[illegible] rainfall of about 40 inches, but [illegible] New Jersey [illegible] very sandy. In raising [illegible] enough water stored in the soil from [illegible] for the third and fourth [illegible] a little water may be the means [illegible] inches per acre in that State. Irrigation [illegible] small fruits. The people at [illegible] 60,000 people within striking distance [illegible] New York [illegible] coming in these days a large amount [illegible] which we now [illegible] strawberries, lettuce, and the like. New [illegible] farm crops are raised in quality and quantity [illegible] these supplemental irrigation plants are going in a [illegible] Atlantic seaboard, and nearly all of these are pumping [illegible]

Mr. ANDERSON. I have had occasion to investigate a system [illegible] invented by a gentleman named Freel [illegible] of Big Fork, Minn.?

Dr. FORTIER. Yes; that came up in our office some years ago. I [illegible] that case now.

Mr. ANDERSON. He has a system of plowing and banking the land [illegible] of the fall so as to conserve the rainfall.

Dr. FORTIER. Yes.

Mr. HOWELL. That would have to be on very level land, though?

Mr. ANDERSON. Not necessarily.

Mr. HOWELL. Have you any estimates of the cost of raising water [illegible] for pumping purposes?

Dr. FORTIER. Yes; we have quite a large amount of data on that [illegible] Mr. Howell; but it varies so with the conditions.

Mr. HOWELL. And of the cost of fuel?

Dr. FORTIER. Yes; and of the cost of fuel. In southern California fuel oils are very cheap. In some places they pay only 1 cent a kilowatt hour for electric current, whereas in other places it is as high as 6 cents or more.

Mr. HOWELL. Do you know any sections of the country where pumping water is resorted to for anything except for the more expensive crops?

Dr. FORTIER. I was speaking of the rice crop a moment ago. Rice is not an expensive crop, but it is a crop which requires a large amount of water.

Mr. HOWELL. It is expensive when compared with the wheat and corn crops, is it not?

Dr. FORTIER. The cost of producing rice is out of my line, but, I ppose, it would run about $30 an acre, including the water.
The CHAIRMAN. This irrigation to which you refer, in the East—ew Jersey—and down South, as in Florida, is that overhead irri-tion?
Dr. FORTIER. Part of it is overhead irrigation—what we call the ray system.
The CHAIRMAN. Is that becoming more universal than it used be?
Dr. FORTIER. Yes; and we hope to hand you a bulletin on that bject in a few weeks, Mr. Chairman. We find that it is not only ing used quite extensively in the East—in the humid regions, as say—but they are also taking it up in the West under arid condi-ns.
The CHAIRMAN. In the studies of pumping for irrigation, what you trying to determine in a practical way?
Dr. FORTIER. The right kind of pumps, the right kind of engines d motors, how to install them, the operating costs, and what to do th the water after it is pumped. These are all practical questions, ich we are trying to solve in this connection.
Mr. HELGESEN. Is the ordinary well water that is good for drink-g purposes safe for irrigation?
Dr. FORTIER. Yes, sir.
Mr. LEE. You say that you have been successful in irrigating ndy soils. Now, is it practical to irrigate where you have the l-clay soil?
Dr. FORTIER. It is more troublesome, but it can be done.
Mr. LEE. Does it pay?
Dr. FORTIER. That, of course, would depend entirely on local con-ions. We do not recommend irrigation for the cheap crops in the st. I doubt very much if it would pay to irrigate cereals such corn.
The CHAIRMAN. How about cotton?
Dr. FORTIER. Well, there has been a large development in the igation of cotton, Mr. Chairman. In the Southwest, including Imperial Valley, Arizona, and Texas, there has been an enormous rease in the acreage of irrigated cotton.
The CHAIRMAN. I mean irrigation for cotton in the eastern sec-n—in the Carolinas, Georgia, and Alabama.
Dr. FORTIER. No; I doubt very much if it would pay.
The CHAIRMAN. I would not think so.
Dr. FORTIER. In order to make irrigation pay in the East, we figure t the farmer would need to have net returns of between $50 and an acre.
The CHAIRMAN. These studies, as I understand it, are to develop cost of this pumping apparatus, the cost of installation, the cost fuel, the cost of the oil needed, and the cost of labor in connection h them, etc., and so on?
Dr. FORTIER. Yes, sir.
The CHAIRMAN. With a view to developing ultimately whether or certain types of pumps, or if any pumps, will pay for producing tain kinds of crops under certain conditions?
Dr. FORTIER. Yes, sir.
The CHAIRMAN. Is that right?

[illegible] Mr. Chairman, I want to ask you about these wells.

Mr. [illegible] I have some new language here, which [illegible] this language is agreed to, [illegible] wells, as was done some years [illegible]

The Chairman. [illegible] this way. In our office last spring [illegible] and matters concerning [illegible] this line of work, that a [illegible] something more than we had been doing in [illegible]

Mr. Hayden. [illegible] some years ago, as I [illegible] because they did not believe [illegible] the experiments did not [illegible] As I remember it, it cost about $10,000 to irrigate [illegible] but something like that.

The Chairman. I am inclined to think that your reference is to [illegible] of the department.

Mr. Hayden. It was in the Department of Agriculture, [illegible] the Western States.

Mr. Anderson. Out in Nebraska, was it not?

Mr. Hayden. In Dakota, I think.

The Chairman. The State of Kansas appropriated a large [illegible] for well sinking, and I don't very much [illegible] But we have had nothing to do with

Mr. Howell. I think you are thinking of the Reclamation S

Mr. Hayden. Oh, no; I am not thinking of the Reclamation [illegible] thinking about what the Department of Agriculture

Mr. Howell. The Reclamation Service obtained water by w [illegible]

Dr. Fortier. If I mistake not, we had nothing to do with [illegible]

Mr. Hayden. Not in the last five or six years, but the depa [illegible] doing that very thing some years ago, if I remember righ

The Chairman. You have been connected with the depar Dr. Fortier, for how long?

Dr. Fortier. About 20 years, off and on, and I have been in [illegible] of this little division for about eight years.

The Chairman. Have you done any work on the sinking o since you have been in charge?

Dr. Fortier. No; I think I may say no to that question. W investigated wells, of course, but we have not sunk any wells. it be putting down a two-inch point or something of that which would hardly come under your question.

The Chairman. Do you know whether or not the Geologic vey does sink wells?

Dr. Fortier. Yes; they have done more or less of that k work.

The Chairman. But you yourself have not done any in t eight years, to your certain knowledge?

Dr. Fortier. No; our work has been to utilize the wate wells.

AIRMAN. What do you propose to do under this new lan-

TIER. As I was proceeding to explain, we put in the item
but the Secretary thought it inadvisable to increase the
ion, so the money was struck out but the language re-
can see no harm in retaining this language. It would
e us a little more freedom in this work, which is con-
panding all over the country.
AIRMAN. Suppose the committee took your view of it and
nguage in without an appropriation in the bill; how much
erhaps expend in the development of water for irrigation
rground sources and the sinking of necessary walls?
TIER. You understand that we already have authority to
pumping plants and wells.
AIRMAN. Yes. That will take care of your underground
t pumping?
TIER. Yes. We will probably not expend in 1917 more than
thousand dollars in the work of sinking wells.
AIRMAN. Just what would be your purpose in sinking
here would you sink them?
TIER. I think the bulk of that work would extend from the
t Valley down to Florida, to be done with the view of
the present methods of well development and pumping

VELL. What does it cost to sink a well in the Connecticut

TIER. In New Jersey (I am more familiar with that State)
about $200, perhaps, because the water table is close to

How much a foot?
TIER. That would be, if the water is had at 25 feet,

GESEN. $8 a foot.
TIER. Eight dollars a foot; yes.
AIRMAN. Let us get at this. It is important, because the
has had to deal with it twice on the floor of the House,
llection, and always in the Senate. If this language is
remain and you did have the money and the authority to
wells, what would be your purpose in doing it—to study
the sinking of the wells, or what would you try to deter-
that language?
TIER. It would enable us to do this, Mr. Chairman: We
the well and control every feature of it for a year, say,
time we could make a full investigation of every feature—
the rate of inflow, and the amount.
IRMAN. Would you not have to go to the extent of sinking
practically every type of soil and every different type of
n throughout the country before you could arrive at any-
a definite conclusion and before you could standardize
ses?
TIER. There is something in that, although I think a num-
cal wells would cover quite a large portion of the country.

[illegible]

[illegible]

[illegible]

ion of a great many hundreds of homes. But, as I understand our object is not to ascertain anything of that kind—to demonte whether water can be found on the public domain.

r. FORTIER. Yes; I had that in mind last summer when I was in southern part of your State and in Nevada. In Nevada particuy there is no end of A No. 1 land in the southern part, and all eeds is water. That land may remain comparatively idle and thless for generations; but if even one man was to go in there and l the means to dig a well and find water, then, as you say, that uld be a nucleus around which a thriving community might grow.

Mr. HOWELL. And result in the settlement of the entire region.

Dr. FORTIER. But, Mr. Chairman, I am not here urging the retenn of this clause; I am simply expressing a preference.

The CHAIRMAN. We are not criticizing you at all; we are trying get information. You will find that this committee is very sympatic with regard to anything that looks practicable in the way of ping agriculture. But I think probably another objection to this tter might be in the fact that we understand the Geological Survey ow doing the very type of work suggested by Mr. Howell. They working to determine where the water can be found there, and it ery necessary that we do not develop another line of work with same object in view, you know.

uppose you take up your next line "irrigation appliances and ipment," and tell us what you are doing there.

r. FORTIER. In this item we have to deal with structures of all ls. As many of you know, irrigation has been developed in the st by the poor man, and at first he had to get along with make-ts. In this respect irrigation resembles our country roads. Now are trying to improve the practice by introducing concrete rever it will prove economical, making designs of wooden struct-; and trying to improve the practice all along the line. Here ulletin No. 126, "Concrete Linings." That bulletin was issued ort time ago, and it gives not only the losses in earthen canals, but proper methods of lining canals with concrete. That, I think, give you some idea of the nature of the work that is being done er this item.

he CHAIRMAN. Take up your next project, "Flow of water for gation in ditches, pipes, and other conduits."

r. FORTIER. There are something like 85,000 canals or ditches in country, and we are investigating typical canals of this kind rder that we may improve their carrying capacity and the like. are determining the flow of water in such canals and the proper ods of removing silt and vegetation.

he CHAIRMAN. Take up "Measurement of water for irrigation."

r. FORTIER. In that item I may say that the State of Colorado come to our assistance and has erected a very good hydraulic ratory in which accurate tests can be made of measuring devices as are used in irrigation. The building was erected by the e of Colorado at Fort Collins, and we have been allowed the use for several years, and excellent results are being obtained there operation with the State of Colorado.

he CHAIRMAN. How many men are employed on that work, on h you are expending $6,700; two or three men?

Dr. FORTIER. The State of Colorado puts up about $6,[illegible] aim to [illegible] that.

The CHAIRMAN. Some of this money, I presume, goes into the purchase of appliances and equipment, does it?

Dr. FORTIER. Yes.

The CHAIRMAN. Take up "Customs, regulations, and laws relating to irrigation." You are proposing to spend $8,000 on that. How long have you been collecting these irrigation laws?

Dr. FORTIER. That was the major part of our work in the early days, but we find that there are other lines that should be placed at the head of the list now, so that you will find in looking back over the report, Mr. Chairman, that the expenditure under this item has been increasing as the years go on. But this is true, too, that owing to the work that this division has done during the past few years, the irrigation laws on the statute books of the Western States have been very much improved, we think. There is, however, still room for improvement. We are now going to the farmers to get from him how these laws operate, so that we are studying as a rule, the questions of customs, regulations, and laws relating to irrigation from the farmers' standpoint.

The CHAIRMAN. That gives me a new idea about it. I had the idea, as I am sure the committee did, that this whole $8,000 was being spent here in some library in gathering together these laws, collating them, digesting and indexing them, and matters of that kind. And I thought, if that was the case, that we have been a long time getting about it.

Dr. FORTIER. No, sir; I think that would prove of very little value. Take, for instance, northwestern Wyoming. The head of the water supply falls as snow on that section; part of it flows into Snake River, westward and finally into the Columbia, and another part reaches the Mississippi by means of the Missouri River. Now, that snow when melted may be utilized for irrigation 200 or 300 miles distant from the source, and it is a bigger task, in my opinion, to distribute the water than to distribute the mail of the United States.

The CHAIRMAN. I think, Doctor, we are misled in the language used. Your real work now is the application of laws, customs, regulations pertaining to irrigation; is that it?

Dr. FORTIER. Yes, sir.

The CHAIRMAN. If that is the case I can see some value in the item; but if it is just for the purpose of collecting laws and indexing that is a different proposition.

Dr. FORTIER. No; the water has to be divided up equitably among those entitled to its use, and so it is a very important part of the irrigation of the West.

Mr. HELGESEN. Mr. Chairman, in the next Program of Work would it not be well to so state that project that the purpose of the work will be more clearly set forth?

The CHAIRMAN. I think so. I think it is a very unfortunate piece of language, Dr. Fortier.

Dr. FORTIER. I admit that, Mr. Chairman.

The CHAIRMAN. It conveys a completely wrong impression. Is there anything further you desire to say?

Dr. FORTIER. No, sir.

CHAIRMAN. We are very much obliged to you. Now, we will
p drainage investigations.

MENT OF MR. S. H. McCRORY, CHIEF OF DRAINAGE, OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

McCRORY. There are in the United States approximately
),000 acres of land in need of better outlet drainage and from
),000 to 300,000,000 acres of farm lands that are in need of
ed farm drainage.
work of the drainage division may be divided into three classes:
ork with community drainage projects, organized under the
f the various States, which are the drainage-district organ-
s that are found in most of the States; (2) the farm-drainage
which gives assistance to the individual farmer in solving his
ge problems; and (3) the research or technical work under
we undertake to solve general problems of engineering relat-
drainage work. This, briefly, is the work that we are doing.
esume that you wish me to discuss the various items?
CHAIRMAN. Yes, sir.
HELGESEN. Are you doing any of the physical work or sim-
iding the organizations of the farmers in doing their work?
McCRORY. Simply guiding the farmers in doing their work.
ve no authority to do any of the construction work.
HELGESEN. Do you cooperate with the counties in drainage dis-
where large ditches are dug?
McCRORY. We are doing a great deal of that kind of work.
ANDERSON. My State was doing a great deal of it, and I was
ring whether you were cooperating with it in any way.
McCRORY. We have done very little in Minnesota recently. A
r of years ago we did some work on quite an extensive project,
have had recently very few requests for assistance in the

CHAIRMAN. All right, Mr. McCrory; take up your different
f work and briefly discuss them.
McCRORY. The item for supervision includes expenses——
CHAIRMAN. Never mind about that; we know what that is.
McCRORY. Construction, operation, and maintenance of drain-
provements. The object of this work is the collection of in-
ion that will be of benefit to the landowners and farmers in-
d in drainage work. As a result of this work, we have pub-
recently two bulletins on machinery used in constructing and
ining drainage ditches.
are also doing some work on the maintenance of drainage
. There is probably expended at least $10,000,000 each year
United States for open ditches. Practically no maintenance
s being done on these, and they deteriorate very rapidly. Our
gations in the Middle West show that the average life of the
ry drainage ditch at the present time is from 10 to 15 years.
what data we have been able to collect we believe that if these
res were properly cared for the cost of maintenance could be
d to possibly 2 or 3 per cent of the construction cost, while as
e now being cared for the cost is from 5 to 10 per cent. There

of building the drainage ditches will increase there as it necessary to construct the ditches in the rock. The settle- e is quite important on that account.

AIRMAN. I see the relationship of that. Take up your next rm drainage."

CRORY. The work under that is largely of two kinds: One rk with individual farmers, the other is a study of the re- s of farm drainage systems. We have been making a series nents on a farm in Alabama, where they have a heavy clay l of large areas in the State, to determine the proper depth ng of drain tile. When the work was started, in 1911, the as very common that that soil could not be drained; or, if e, that the cost would be prohibitive. Our work there has that particular soil that we can space the tile about 70 to art and not less than 4 feet deep and get very good results. k has probably saved the landowners in the black belt of about $20 an acre in their underdrainage work.

doing similar work on a great many types of soils scat- the humid region of the United States.

AIRMAN. Is there any conflict between the line of work you described and the work that is being done by the Office of nagement?

CRORY. No; I think they are doing nothing of that kind. never been any conflict, so far as I know.

AIRMAN. Take up the subject of "drainage of irrigated

CRORY. The work of the drainage of irrigated lands is, of ated in the West. That work is carried on at the present a force of eight men. The work consists primarily of to landowners and community projects—drainage dis- th the various problems that may confront them. We are some technical work there in order to determine the best f draining these lands.

WELL. Are you prepared to furnish plans to any company s to undertake drainage of an irrigated area that is water-

CRORY. As far as our resources will permit. We have had ny requests for assistance in that country, and we endeavor with as many as possible.

AIRMAN. The next item is "organization, financing, and lation of drainage districts."

CRORY. We have found for some time past that there has at deal of difficulty among the people who desire to organ- ge districts in regard to the proper methods to pursue in the districts, particularly in regard to financing the dis- e have recently made some investigations along that line. ary object was to find out what particular, specific difficul- eople were encountering and how they could be remedied. difficulty seems to be that the men are frequently unaccus- dealing with large problems, and when they deal with the nd of their problem they make a great many mistakes that nely costly. For instance, I know of two districts in the est located about 200 miles apart in the same State. One

[illegible]

Mr. [illegible]

Mr. [illegible] Is [illegible] by statutory enactment [illegible]

Mr. [illegible] State has its own legislation in regard [illegible]

Mr. [illegible] [illegible] they sell their [illegible]

Mr. McCrory. They sell the bonds immediately after the [illegible] and before the surveys were made. There was a [illegible] [illegible] It took [illegible] months to [illegible] [illegible] That they had to let their [illegible] [illegible] large dredge boats. I should [illegible] three years before they made any large expenditures [illegible] the fund realized from the sale of their bonds. The other district was similarly situated, but with better financing they utilized their money to better advantage.

Mr. Howell. They did not get the money until they were ready for it?

Mr. McCrory. No.

The Chairman. Take up your "run-off investigations."

Mr. McCrory. The run-off investigations are made in drainage districts to determine the coefficient of run-off that should be used in planning these ditches successfully. Drainage works have been c

tructed for a number of years, but there have been practically o measurements of this character made. There is great need for nformation of this character. I get more requests from engineers ngaged in drainage work for information of this character than for ny other kind of information that they request. The work has been arried on in North Carolina, South Carolina, Mississippi, Tennes-ee, Arkansas, Illinois, and possibly one or two other States. We are etting some information that is proving of considerable value to the ngineers in designing drainage work.

Mr. ANDERSON. You have not discovered any way to make water un up hill, have you?

Mr. MCCRORY. No, sir.

Mr. ANDERSON. That is what we seem to need most in some sections f our country.

Mr. HELGESEN. It does it naturally out in our country.

Mr. HOWELL. I was about to inquire, if the larger areas of those tates could be reclaimed by drainage, why so much of this energy as expended on those particular States. It seems to be all out in ne section of the country.

Mr. MCCRORY. The run-off work has been located where we can et systems that are well adapted to that particular work. It is only ithin the last two or three years that we have been able to find loca-ons that were suitable and satisfactory for such run-off investiga-ons.

The CHAIRMAN. Take up your next project, "drainage of tidal arshes."

Mr. MCCRORY. We have done very little work on that until last ar. We have had quite a few requests but have been doing but a nall amount of work. There is quite a large area of tidal marsh nds along the San Francisco Bay. The soil is very peculiar and esents some rather peculiar drainage problems. We are doing me work there with tile drains to determine their effect, and we are so doing a little work along the Atlantic coast. I do not think we ll use the amount estimated for this year.

The CHAIRMAN. Then you have a project on "cost of farm drain-e." There, again, Doctor, how does that differ from the other farm ainage you described a while ago?

Mr. MCCRORY. This is extension work—direct assistance to the rmers. It is one of our best lines of work.

The CHAIRMAN. This is real extension work, is it?

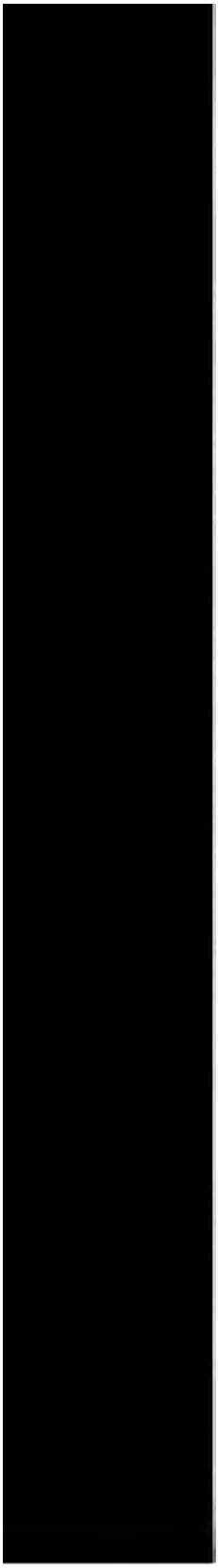
Mr. MCCRORY. It is real assistance to the individual farmers—engi-ering assistance.

The CHAIRMAN. The next is "drainage of overflowed lands."

Mr. MCCRORY. The work on drainage of overflowed lands consists gely in assistance to drainage districts in various parts of the ntry. We have given assistance to a number of districts in the ape of consulting advice and in a few districts by assisting with veys.

The CHAIRMAN. Have you had some results from that character of rk? Have your surveys been followed up and your instructions ried out and drainage actually accomplished?

Mr. MCCRORY. The greater part of the surveys have been carried t, especially those made in later years where we have required



iation of the previous year for doing the architectural work. No propriation came to our office for doing the work in connection th the other items mentioned, such as drainage disposal, domestic ıter supply, and the problems involving mechanical principles. The work that we have done, and are doing, in addition to the chitectural work and out of the same funds, we have been able to by borrowing help from other divisions in the office, wherever that ıs possible.

There is an additional feature in connection with that. At the ne this reorganization took place it was the understanding that ere was to be one central engineering bureau, where the engineer- g activities of the department were to be centered, and other bu- aus could call on us for work. I find that these bureaus have ken that literally and are calling on us for considerable work, so at, in addition to the work we are doing for the farmers and other rsons interested, we are being called upon for a great deal of sistance in preparing plans for experimental buildings and equip- nt for the different bureau plants, for bulletin illustrations, and o plans for distribution among county agents and farm advisers. ey are calling on us now for a great many.

Mr. HELGESEN. What are you doing directly for the farmers?

Mr. MCCORMICK. We have prepared and are preparing, as fast as can, general plans of farm structures of all kinds, such as barns, s, houses, sheds, feeding sheds, and everything of that nature, t are adapted to the different localities; that is, we are not taking the case of an individual farmer and acting as a consulting archi- t for that man, but we are ascertaining the conditions in different alities and then designing buildings suitable for those localities. ey will not meet the conditions of every individual farmer, but, far as possible, we try to design our horse barn or cattle barn on same principle as the unit bookcase. Then, if the farmer does want to build a barn as long as our drawing shows, there is a tain point at which he can stop and still have the essential fea- es. Later on he may add to it if he wants to. We are trying to ry out the idea of having those plans serve the greatest possible nber of persons in a given locality.

Mr. HOWELL. How are those plans transmitted so that they can ome available to the public?

Mr. MCCORMICK. So far the only form in which we have them is he form of blue prints, and they are sent out to anyone who re- sts them. We get a great many letters from farmers saying, nd us what you have regarding farm buildings." They not only e to us but to all the Government offices engaged in farm activities. ve have any inkling of what the man has in mind, we send what es nearest to that, and if we can not do that we write him for e detailed information. Then we ask the man, in consideration ur having furnished him with the plans, to keep a close account he cost and also of any changes that he may make and report this s, so that in the collection of data that we are making we can take into consideration. Occasionally we get suggestions which cause o alter our own plans somewhat.

Mr. HOWELL. That is, if a farmer should send you a sketch and that he wanted to build a $3,000 home, you would then send him best plan you had that would be adapted to his needs?

Mr. Herrick: Yes. It takes at least to get out [illegible]

Mr. McCormick: Absolutely, and our drawings [illegible]

Mr. Herrick: Do your activities in this direction [illegible]

Mr. McCormick: We have not so far received or heard [illegible] because the work that we are doing does not [illegible] of architects' practice at all that I know of. In fact, I know [illegible] of a farmer calling on an architect for a house [illegible] less than $5,000 and there are very seldom calls for [illegible] even as high as $8,000. Architects do [illegible] want that kind of business. As a matter of fact, we received [illegible] from the other side from a firm of architects in Buffalo, [illegible] designs for a cow feeding shed that they had gotten up for [illegible] based on some sketches that we had sent them [illegible] received. They took them and developed them to meet his [illegible] It was an expensive job for an agriculturist maybe rather than [illegible]

Mr. Herrick: It is an unfortunate condition, but it is true [illegible] could not have an architect's plans, even though they [illegible] $5,000 or $6,000 for a residence. I say it is unfortunate [illegible] they would get better results if they employed an architect.

Mr. McCormick: There is no question about that, and [illegible] is in a position to get an architect's advice, I would say by all me

t an architect to draw the plans, but that is out of the question if
is going to build a $500 barn or $1,200 house, or even one at
,000. As a matter of fact, architects don't want that kind of busi-
ss.
The CHAIRMAN. Is it the ultimate purpose of this particular line
work to make the Department of Agriculture the consulting
chitect, as it were, for all the rural communities?
Mr. MCCORMICK. Hardly the consulting architect, but it is our
rpose to have available in the department information, drawings,
d plans of buildings that have proven to be adapted to certain
nditions, which may be employed as a whole or which can be modi-
d by the individual.
The CHAIRMAN. And the only cost to the department, I take it,
uld be the actual cost of the correspondence?
Mr. MCCORMICK. After the plans are once prepared; yes, sir.
The CHAIRMAN. After the plans are once prepared?
Mr. MCCORMICK. Yes. Of course, there are the architect's and
aftsmen's salaries. We have not been able to do this past year with
r appropriation something which we would like to undertake. A
ry desirable feature is to enable those men to go into the different
alities and study conditions much more closely than they have.
The CHAIRMAN. How large a demand has come to you in the past
months for this kind of information?
Mr. MCCORMICK. I should say from three to five requests a day.
Mr. HELGESEN. That is hardly a fair question, because "in the
t six months" includes the wintertime when no building is done.
u ought to make it in a year.
The CHAIRMAN. Make it the last 12 months.
Mr. MCCORMICK. I don't know. We were not organized until
ly.
The CHAIRMAN. That is why I asked it for six months, because
new they had not been operating under this system for 12 months.
Mr. MCCORMICK. In one case that I might mention we heard that
re was considerable need for corn storage in some localities, and
of our architects went to work immediately on a convenient and
nomical type of corncrib. It was published in the department's
ws Letter, I think, in November, and since then we have had re-
sts for 200 copies of the drawings for that corncrib. How many
those will be used or built, I don't know.
The CHAIRMAN. I was just wondering how many requests you had
these.
Mr. MCCORMICK. As to that one item, I think a very conservative
imate is that we could supply four or five times as many of such
e prints of different designs as we have on hand or could get out
some time.
The CHAIRMAN. In addition to that kind of work, you are also
estigating farm drainage, water supply, and sewage disposal?
Mr. MCCORMICK. Yes, sir.
The CHAIRMAN. What are you doing?
Mr. MCCORMICK. That is in connection with securing for the
mer or dweller on a small tract of land a supply of water that is
sonably free from the danger of pollution and to assist him in
posing of the waste from the house in a sanitary manner. In

The Chairman: It seems to me that there is a gr
dissemination of the information which you gather
Mr. McCracken: It is. There are a wonderful
and the sad reason we are not doing it to a greater
is the fact that we have not been able to fulfill all
The Chairman: At one time I had some doubt a

re to be employed and to supervise the actual construction
ry.
AIRMAN. If you do that and do not build up a tremendous
on of your own, I am satisfied it is a fine work.
CORMICK. For some time to come, Mr. Chairman, our or-
ı itself will have to be built up at the other end—that is,
rather than dissemination of the information.
AIRMAN. Of course, your organization can not be built up
ı committee helps you.
CORMICK. No; and it can not go very far on last year's
tion.
WELL. I notice in your project book you state that field in-
ns are being carried out in the Northwest wheat belt to dis-
causes of dust explosions in thrashing machines and to
ventive measures.
CORMICK. Yes, sir.
WELL. If I remember aright, when the Bureau of Chemistry
e us they also stated they were engaged on some line of
ıat kind.
CORMICK. This is a cooperative investigation between the
us. The Bureau of Chemistry had two men in the field
l two men in the field from my division, and as a result
vestigation we have an apparatus completed to-day which
s an automatic fire extinguisher, and which we will ship to
u of Mines at Pittsburgh next week. We are going to test it
explosion galleries at Pittsburgh, and if it works, as we
ll, it will extinguish a fire after starting.
e two other devices which we hope will prevent the starting
ı many cases—those that are due to static electricity.
WELL. There is no duplication of work in this?
CORMICK. Absolutely none. It is strictly a cooperative in-
ı.
AIRMAN. You have the engineering feature of this work——
CORMICK. And they have the chemical.
AIRMAN. And they have the chemical?
CORMICK. Yes.
AIRMAN. In regard to item 49, there is no change there,
son?
SON. None at all.
AIRMAN. We are very much obliged to you, Capt. Wilson,
ır assistants for your statements.
ıpon, at 5.10 o'clock p. m., the committee took a recess until
a. m. Saturday, February 5, 1916.)

CANCELLED

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Thursday, February 10, 1916.

he committee met at 10 o'clock a. m., Hon. Asbury F. Lever
airman) presiding.

TEMENT OF MR. CHARLES J. BRAND, CHIEF OF THE OFFICE OF MARKETS AND RURAL ORGANIZATION.

he CHAIRMAN. Turn to page 192 of the Book of Estimates, and will this morning take up the Office of Markets and Rural Or-ization. I will ask Dr. Brand, chief of that office, to take up the utory roll first and explain by items, as I call them out, the ons for any changes.

irst of all, Dr. Brand, I notice one chief of office, transfer from p fund for administrative expenses, $4,500. That covers your employment?

Ir. BRAND. Yes, sir; that is my own salary, and according to the visions of law it is required that administrative and clerical posi-s of that character shall be transferred to the statutory roll.

he CHAIRMAN. Last year it was carried under the lump fund?

Ir. BRAND. Yes.

he CHAIRMAN. Has the lump fund been reduced by that amount?

Ir. BRAND. The lump fund has been reduced by a corresponding ount.

he CHAIRMAN. Next is one administrative assistant by transfer n lump fund for administrative expenses, $1,980. That is a nsfer with a reduction in the lump fund and at the same salary?

Ir. BRAND. That is a mistake, Mr. Chairman. Through a mis-erstanding, this appears as a transfer from lump fund. As a tter of fact, it was included as one of the positions in our esti-es for administrative expenses under the lump sum, but was not existing position. It is a new position, but by error it has been ed here a "transfer."

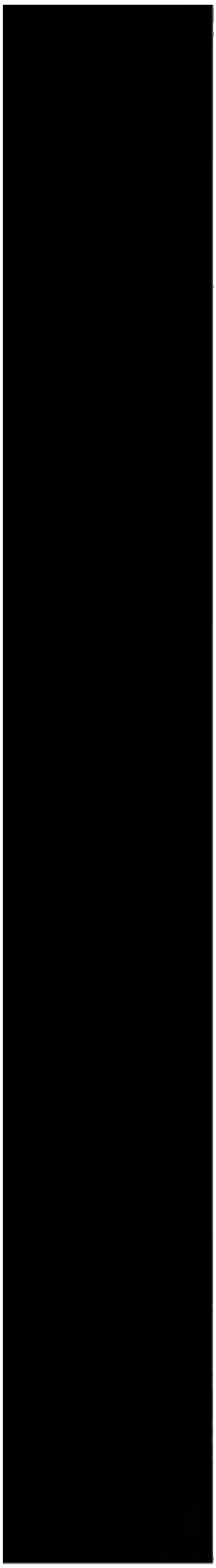
he CHAIRMAN. It is a new position?

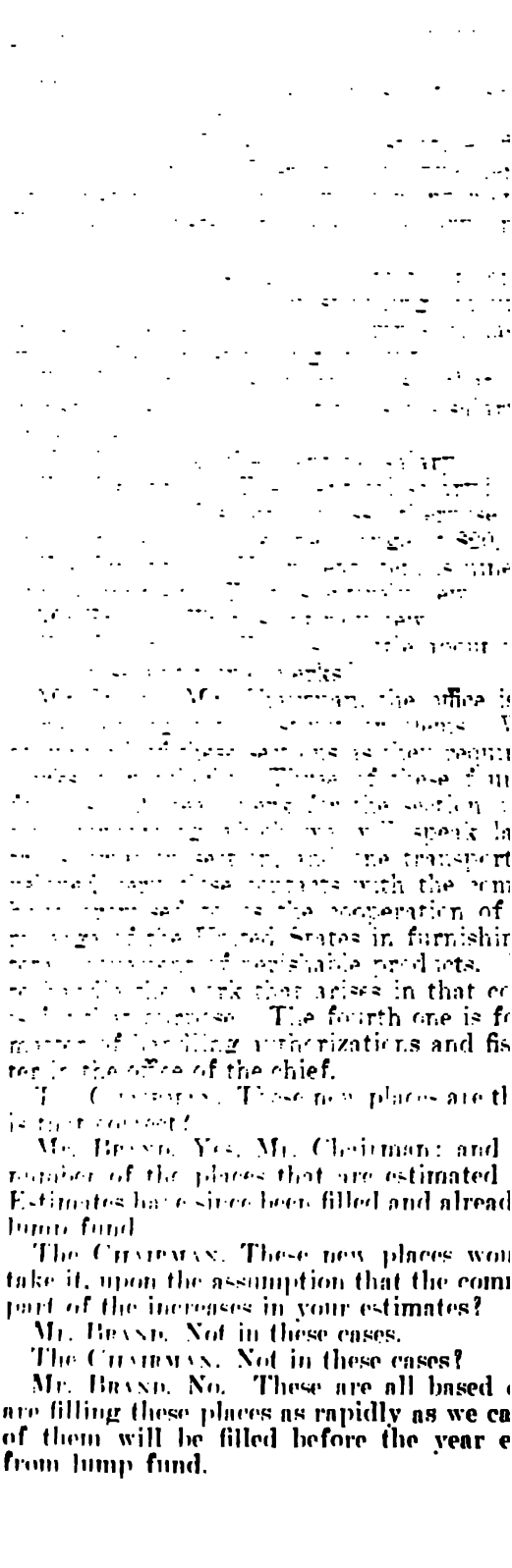
Ir. BRAND. A new position.

he CHAIRMAN. Not by transfer?

Ir. BRAND. No, sir.

f it please you, Mr. Chairman, this new position is to be filled a person to assist in the administration of the United States on-futures act. That work is a matter to which I give a great of personal attention, and this person is to assist in the admini-ive work in connection with that act. Much of the work is very cting, requiring a great deal of personal care and attention, as you erstand, Mr. Chairman, from the character of the regulation that ndertaken.





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he CHAIRMAN. Now, item 6: Fifteen clerks, class 2, increase of
2 by transfer from lump fund for enforcement of cotton-futures
1 by transfer from lump fund for administrative expenses, and
ew places. The transfers have reduced the lump fund and are
le at the same salaries? Tell us about the three new places.
Ir. BRAND. Mr. Chairman, as to the three new places, two of them
already filled. One has been filled by the employment of a
istical clerk and the other is in process of filling by the appoint-
it of a stenographer by transfer, so that two of them, at this
nent, would come under what constitutes transfers from the lump
. The last one is a clerk to assist in our cooperative purchasing
marketing project. That is not yet filled but will be filled as
as we can find a suitable person.
he CHAIRMAN. In these places you are just setting out what you
doing in the office?
Ir. BRAND. Yes, sir.
he CHAIRMAN. Item 7, one clerk by transfer from lump fund
marketing and distributing farm products. The lump fund
been reduced and there is no change in salary?
Ir. BRAND. That is correct.
he CHAIRMAN. The next one is one clerk, at $1,320, by transfer
n lump fund for enforcement of cotton-futures act. Does the
e explanation apply there?
r. BRAND. Yes.
he CHAIRMAN. Item 9, 21 clerks of class 1, increase of 11, 5 by
sfer from lump fund for marketing and distributing farm prod-
, etc. Tell us about the new places, of which there are three.
r. BRAND. The explanation that I gave for the sixth item—I had
)ped my eye down to the ninth item—should apply to the ninth
. As to the sixth item of three new places, one has actually been
l by a head clerk for the seed, grain, and hay marketing project;
second, a head clerk for the city marketing and distributing
ect has been requested. We have already asked the Civil Serv-
Commission to certify a man to fill that place. The third is for
dditional auditor in our division of supplies and accounts.
ıe CHAIRMAN. Give us the explanation of item 9.
r. BRAND. Shall I repeat the explanation for item 9?
ıe CHAIRMAN. Yes, sir; repeat that.
r. BRAND. Two of the places are already provided for. One
stical clerk has actually been appointed and is now serving. The
l Service Commission has been called upon to certify a male
)grapher. The third place is for an assistant clerk in our co-
ative purchasing and marketing section.
ıe CHAIRMAN. Item 10, calling for one clerk at $1,140, by trans-
rom lump fund for marketing and distributing farm products.
the same explanation apply there?
r. BRAND. The same explanation.
ıe CHAIRMAN. Item 11, calling for 10 clerks at $1,000 each, etc.,
)ne new place. Just explain the new place.
r. BRAND. That new place at $1,000, Mr. Chairman, has already
filled and is now occupied. It was not filled at the time the
ıates were prepared.
ıe CHAIRMAN. These estimates were made when, Mr. Brand—
t September?

as it is scarcely possible to transfer in a body to the photographic section of the department.

The CHAIRMAN. I see you have in the next item one photographer by transfer from lump fund for administrative expenses. Is the character of his work the same as the one above, and does the same explanation hold?

Mr. BRAND. Yes.

The CHAIRMAN. How do those salaries compare with salaries paid photographers in the commercial world?

Mr. BRAND. For photographers of this character, men who not only do photographic work but who supervise the work of others to a considerable extent and are responsible for files, I should say that the salaries are possibly a little bit low. One of these men, especially, a particularly capable man, and both of them compare very favorably with the photographers that I happen to know in other branches of the service. One of them came to us from the Interior Department at the same salary he was receiving in that department.

The CHAIRMAN. Item 23, one telegraph operator, a new place at $1,400. What need do you have for a telegraph operator?

Mr. BRAND. Mr. Chairman, in our work, both under the cotton futures act and in our experiments in market-news service, which I described to the committee last year and proposed as one of the activities for the current year when I appeared before you the last time, we handle a very large volume of telegraphic business. This man's duties are in connection with those matters. He handles the quotations from the spot markets, in the matter of cotton, and the quotations from the markets on perishables in our market-news work.

The CHAIRMAN. When we get to that item, Doctor, I wish you would remember to have whoever discusses it tell us something about the telegraph rates—the tolls, and so on. The question will likely come up on the floor.

Mr. BRAND. I will do so.

The CHAIRMAN. Item 24, one telegraph operator. That is a transfer at the same salary, I presume?

Mr. BRAND. Yes.

The CHAIRMAN. That is also true as to item 25, one map tracer.

Mr. BRAND. Yes.

The CHAIRMAN. What does he do?

Mr. BRAND. A wide variety of work, not all of which is tracing; but it happens that the examination of the Civil Service Commission under which we are able to get this kind of ability is entitled "Map tracer." The examination, I think, originally was held for the Geological Survey. Our work involves the measurement of the length of staple of various fibers, particularly cotton, drafting of various kinds, and similar duties; the lettering of charts and the preparation of various diagrams; all this work is expected of a person who is capable of doing map tracing. It merely happens that that register produces the kind of ability that we need for that work.

The CHAIRMAN. I see you have three of them, Doctor, all comparatively low-salaried men?

Mr. BRAND. Yes.

The CHAIRMAN. Do you have a good deal of that work?
Mr. BRAND. A great deal. They are women, as a matter of fact, Chairman.
The CHAIRMAN. Do you have a good deal of work of this character?
Mr. BRAND. Yes; we have, especially in the matter of studies of gth in cotton, which will be extended to other qualities as soon as can finish our studies in that respect. I will say that several of se persons were transferred with the change that was made last r in uniting the cotton-standardization work with the cotton work he Office of Markets. Two of these particular employees were in t work.
The CHAIRMAN. Item 29, one laborer, at $720, by transfer from p fund for administrative expenses. The same explanation, is it?
Mr. BRAND. Yes, sir.
The CHAIRMAN. Item 30, one laborer, at $660, by transfer. Same lanation?
Mr. BRAND. Yes.
The CHAIRMAN. I see you have dropped two messenger boys, at) each, and changed their designation to messenger boy or laborer. change of title there, I presume, is to give you a little more bility?
Mr. BRAND. More latitude in the assignment of duties.
The CHAIRMAN. No change in the salaries or the number, but just ange in designation?
Mr. BRAND. Yes.
The CHAIRMAN. Change of one laborer at $540 to one messenger or laborer at $540.
Mr. BRAND. For the same purpose, Mr. Chairman.
The CHAIRMAN. There is no change in the number of these mes- er boys or laborers under item 32?
Mr. BRAND. They are actual transfers over from lump fund from tions previously occupied.
The CHAIRMAN. Then you drop four messenger boys at $480 and ge to four messenger boys or laborers, at $480 each, in item 33. e is no change there, is there?
Mr. BRAND. No change.
The CHAIRMAN. Item 34, one messenger boy, at $420, by transfer lump fund for marketing and distributing farm products. That e same explanation?
Mr. BRAND. The same explanation.
The CHAIRMAN. In item 35, two charwomen, at $480 each; same anation?
Mr. BRAND. Same explanation.
The CHAIRMAN. Now, item 36, one charwoman, at $300; the same anation?
Mr. BRAND. The identical condition.
The CHAIRMAN. Item 37, two charwomen, at $240 each; the same anation?
Mr. BRAND. Yes.
The CHAIRMAN. These $240 charwomen here—just what are their s?
Mr. BRAND. Cleaning up. They only work part of the day.

e work that I want to present first is the cotton handling and eting work, which has been under way about four years. That first regular project in the Program of Work.

. STEELE. I do not know that this is the proper time to intro- it, but is there any other appropriation connected with this di- n?

e CHAIRMAN. Oh, yes; there are several more items there, Mr. e—items 39, 40, 41—half a dozen more items that follow this. t particular thing had you in mind?

. STEELE. What I had particularly in mind was how much the opriation was last year—the total amount from every source.

e CHAIRMAN. For marketing?

. STEELE. Yes.

. BRAND. $484,000, roughly.

. STEELE. Is that a permanent appropriation, and then this an ion?

e CHAIRMAN. This is an annual appropriation which this com- e makes from year to year.

. BRAND. That is annually.

. STEELE. Then, that will be included in the expense of this ion?

e CHAIRMAN. Yes.

. STEELE. $480,000 and how much more?

. BRAND. $484,000 plus an unexpended balance of $100,000 under otton-futures act.

. RUBEY. I want to take up a matter with Mr. Brand at some I do not know whether now is the time or not. It relates to narketing of live stock.

. BRAND. Gov. Rubey, Mr. Hall, who is the leader of that par- ar project, will present it in detail, and we will be glad to answer question then or now, as you prefer.

. RUBEY. I just want to find out so that the question may be l in the regular order and at the proper time.

e CHAIRMAN. Go on, Doctor, with your cotton handling and eting.

. BRAND. Some features of this work have been brought to the tion of the committee before. The particular lines of work that eing conducted include what we call primary market surveys, nich we have given a great deal of attention, with a view to de- ning with a degree of scientific accuracy the conditions that il in the transfer of title of cotton from the farmer to the r, with the margins and discriminations as to the grades and wise; and the sale from the first buyer to the port merchant, and y to the mills, to determine how much of the money that the er receives is really paid on the basis of the merit of the article he produces. In the course of that work we have carried on ling surveys in considerably over 100 towns, with a result that een exceedingly surprising. We found that on the same day, e same market, the highest grade of cotton sold within that et brought from $3 to $20 less than the lowest grade; in other s, that there is no proper discrimination as to quality when the er parts with his product. We are trying to determine these and to call them to the attention not only of the producer but

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[illegible]

Mr. [illegible]. Have you operated

Mr. Brand. We operated in 22

Texas. I could not name all of th

to the whole State, in

order to cover all cotton pr

Mr. McLaughlin. This committe

to provide for standardizing cotton

becomes a law, somebody must carry

doing. Is it proposed that you a

work shall go out and teach every

mentioned in this standardization

stance, the grades of cotton and the

flaxseed, and so on?

Mr. Brand. The two bills with

the grading of cotton, which were

Congress, were both reported fave

grain-grades bill has been report

cotton-standards bill, so far as I kn

IRMAN. The cotton-standards bill has not been brought committee. Mr. McLaughlin is referring to the warehouse e grain-standards bill, which have been before the com-

ND. The language of that bill refers, as I understand it. ese products when stored in licensed warehouses.
ELL. Is it not a fact that the Department of Agriculture established standards of cotton?
IRMAN. Yes.
ELL. Without any law?
IRMAN. Oh, no; under authority of law, some years ago.
ERSON. Those standards are not compulsory?
ND. Those standards are compulsory only in the settling s on future exchanges. They are not compulsory in the ts.
IN. How many grades have you?
ND. We have 9 white grades, and we have promulgated last two weeks 11 colored standards—5 colors for yellow-n, 3 for yellow-stained, and 3 for blue-stained cotton.
IN. You mean in addition to your nine white grades?
D. We have 9 white grade standards and 11 color stand-he grades of the 9 white standards apply to the color We have adopted the logical method of applying the ite standards to the grade of the color standards.
IN. Have the exchanges in this country all adopted the t standards?
D. The future exchanges are compelled to adopt them. changes, or the greater majority of them, as will be de-r in the hearing, have voluntarily adopted them although ed to do so by law.
IN. Do you know whether the New York Exchange is he Government grades or not?
D. It is.
AUGHLIN. Is it your view that permanently Congress e an appropriation and men should be employed to go h these different grades in all of these staple products— demonstrate them to the exchanges and the large mar-go to individuals and hold schools of instruction concern-ling of each and every one of these products, so that the d seller of each and every one of them may know whether uyer is giving him a square deal?
D. It seems to me that that is a question of policy for ee rather than for us to determine. It would involve ppropriations and would be a very difficult line of work. almost impossible to work with the vast number of pro-we have.
AUGHLIN. You have been doing something by way of to somebody in connection with the grading of cotton. een your work in that regard? What I would like to e you been confining it to the work with exchanges and purchasers and sellers of cotton, or have you aimed to he small individual producers and sellers of cotton?

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Mr. BRAND. The appropriation for that particular kind of work very largely reduced, but in a later item there is a provision a continuation of the necessary part of that work, although, of rse, the figures are very greatly reduced from the figure Mr. Laughlin evidently has in mind.

The CHAIRMAN. My recollection is, Mr. McLaughlin, that the item which you refer was at the time carried in the Bureau of Plant ustry as an increase in the item for the fiscal year 1914.

Mr. BRAND. Yes.

The CHAIRMAN. That was increased by $50,000, and I probably then that I thought that ought to practically complete the dardization work proper, and that whatever other work we did reference to it in the future would be in reference to the demration of the value of those standards. Since that time the k has been transferred to this bureau.

Mr. MCLAUGHLIN. Here is a line of work in which the gentlemen this Office of Markets go to a particular locality and, as Mr. nd says, grade every bale of cotton brought there to be sold.

Mr. BRAND. By the members of the organization with whom we cooperating in this particular investigation and demonstration.

Mr. HELGESEN. If a proper Federal standardization law is enacted, ing it compulsory all over the country, how much of the work you have been conducting in the past would then be necessary?

Mr. BRAND. If such a law was passed I suppose we would have to inue to a certain extent, in connection with the work provided nder the standardization law, to do some of these same kinds of , so long as people do not know how to apply the standards and ot know the standards and so long as new persons are engaging e industry; but, in my opinion, it would all be carried on in ection with the standardization under the law.

r. HELGESEN. If you had a proper law, with competent inspectors ery market, would there be any necessity for the producer knowanything about his grades?

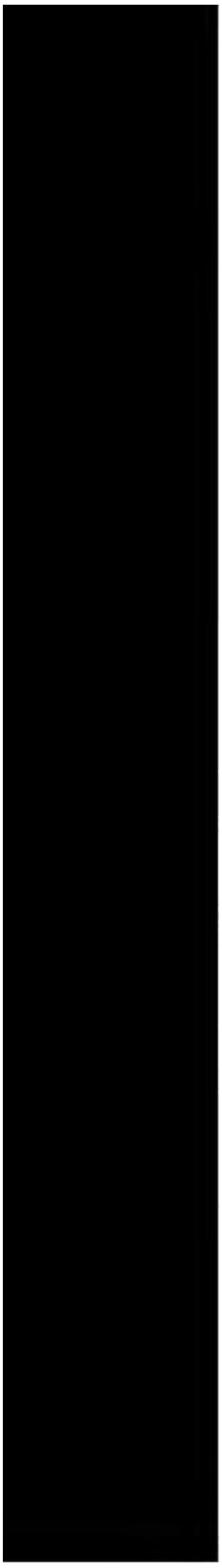
r. BRAND. I think it would still be advisable, but I think there d be a reduction of the abuses and losses due to his not knowing rades.

r. HELGESEN. I can not understand how, under a standardization you would still have to have some one to deal with the inspectors, g that they were properly doing their duty and taking proper es and results to the producer. But I can not understand why uld be necessary for the producer to know what grade he has because, if the inspector gives him a square deal and honest es, that is all he could get. No matter how much he knew he d get honest grades, anyway.

r. BRAND. I think there is a great deal of merit in what you say, till I, as a producer ,would want to know as accurately as I could rade of my product when I was selling it.

r. HELGESEN. That is true. I believe that the Government should ts assistance when they give him a scientific, practical, honest .

r. BRAND. We take that position definitely; that it is not our it is not the Government's duty, to do anything for producers producers can do for themselves. We draw that line. As soon



Mr. Bruce. That question involves cons
given to submit a statement show
the amount expended on it.

Mr. McLachlan. How long was this

Mr. Bruce. Roughly, four months.

Mr. McLachlan. What did it cost?

. BRAND. His expenses per day were probably about $3 in addi-
o his railroad fare. I suppose his whole expense was possibly

. MCLAUGHLIN. At how many places were men similarly em-
d?
. BRAND. It has varied from time to time during the past year.
ng the past year we have worked in about six different places on
particular type of work.
HOWELL. What is the salary of the men?
. BRAND. It varies greatly. Some of them get as low as $1,400
some of them get as high as $2,250. It depends upon their
petence and their usefulness for other activities as well as this
of activity.
. MCLAUGHLIN. To how many places, what kind of places, how
, and so on, is it proposed to send men to do that kind of work?
. BRAND. We confine that absolutely to this proposition: We
ire that there be an organization with which we can cooperate
that there be a problem whose solution appears to be worth
e. We have a great many requests from all over the cotton belt
ssistance, and we select from those only the ones that we believe
produce results valuable in a wide sense—not purely to the lo-
y.
. MCLAUGHLIN. You will pardon me, but you are getting a little
from the subject we are talking about. You spoke of a partic-
line of work. You spoke of problems which you thought would
teresting and necessary of solution, and so on. We were speaking
it a particular one—one place in Arkansas.
. BRAND. Yes.
. MCLAUGHLIN. Will you kindly tell us how many and in what
of places you think that work ought to be carried on?
e CHAIRMAN. He told you it was carried on in six places this past

. BRAND. I would be glad to name them: Sweetwater, Tex.;
den, Ala.; Tarboro, N. C.; and Camden, Little Rock, and Scott,
Those are the chief points.
. MCLAUGHLIN. I suppose there was a reason for selecting those
s. Will you tell us what influenced you in selecting those places
ow many of them you think there are that should be reached?
. BRAND. We were influenced solely by our knowledge of condi-
in the localities, as indicating that we could secure valuable
ts. The promised cooperation of the State authorities, the
ultural college, or the commissioner of agriculture, as the case
be, or the director of extension, has usually been one of the
mining factors. We always work with the demonstration
cies within the States. We select on the basis of a place that
s the investigation, where results can be secured, and where
ooperative contacts that are necessary can be made. We use
general principles in determining all cases.
some of these cases we happened to know in advance of an or-
ation that would carry out its agreements and do all of those
of the work that it agrees to, and, of course, that is an im-
nt consideration in the determination by our office as to where
ill work.

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ill still be in the process of selecting some of those people at
nearly the end of the fiscal year, because we do not believe in
g on a lot of new people until we can digest them, break them
ich them the necessary phases of the Government work, ac-
t them with the work, and we do that gradually. We take these
from the registers and put them in Washington first, and
int them with what they must do, and we can not digest more
a reasonable number at a time. So we are very careful in not
ading at any one time.

STEELE. Of these 275 employees, how many have you in Wash-
n?

BRAND. The majority of those are in Washington—have head-
rs here.

STEELE. Then you have not many out in the field at the present

BRAND. They work from Washington into the field. We have
d very few field stations. During the coming year we expect
some of these people into the field. A new office, Mr. Steele,
ifficult work in breaking in the new people, and you can not
new people in the field until you have gotten them properly
n in. During the coming year we will be in a position to trust
t many of these people in the field.

ANDERSON. Referring again to the line of inquiry started by
IcLaughlin, you have demonstrated to your own satisfaction,
I presume to the satisfaction of those with whom you co-
ted, that where a cooperative organization is established it is
ble and possible for that organization to employ a competent
n to grade the cotton that they have to sell. Do you think it
proper function of your office to continue by putting into these
us cooperative associations men to demonstrate that fact to
satisfaction?

. BRAND. We would not go to a very far limit in that sort of
. Having determined the facts and having demonstrated them
number of typical and representative places, if the producers
eir organizations were not willing to undertake the activity
ould feel there was no use for the Government to spend its
y trying to force them to do things which were apparently to
own advantage.

. ANDERSON. I understand, but if, after you have once demon-
d the feasibility and desirability of the proposition, you are
to merely send a man to a cooperative organization here and
er man to a cooperative organization there for a short period of
to demonstrate to that particular organization the necessity or
esirability of a grader to grade their cotton, you can not cover
ie ground. Consequently your effort becomes a mere special
ege, which you give to people here and there whom you select,
hey are no more entitled to it than anyone else.

. BRAND. There is a special privilege that we recognize and
we protect very carefully; but the results of that work are
very widely available through publications, through the county
nstration agents, and through all of the machinery available,
at it is not specialized to an extent that is contrary to good
e policy. You have got to do your work somewhere; you can
o it everywhere. You select the best place you can possibly

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ton come to them graded into relatively accurate grades. It begins immediately to simplify the distribution of it, and I may say that in no case in the cotton belt itself have any combined opposition to our work. This applies to merchants and their graders.

Mr. Anderson. To what extent is the grading of cotton in the various local markets regulated by State laws in the States in which the markets exist?

Mr. Steele. Practically it is not regulated at all. There has been a grading law which requires that samples be taken at the gin and the grades be declared thereon. It is a new departure and requires investigation before we can determine the method and kind of activity that must be carried out. In one of these cases under this project we are cooperating with the State of Texas in that law.

Mr. Anderson. If the standards for cotton are promulgated, as you say they are, it would be perfectly feasible, would it not, also to establish the machinery for the application of that law at these local terminal markets?

Mr. Steele. In some of the States it would be relatively simple. In a few of them; in most of them it would not. They have not the necessary organization for dealing with the problem. Very few of them have any organization whatsoever to deal with this question.

Mr. Anderson. They could create an organization by State legislation, could they not?

Mr. Steele. I think they could. There would, of course, be a necessity in their activities that would destroy uniformity, I fear.

Mr. Anderson. I do not see how that could be if they were obliged, as I understand you to say they are, to apply a standard which the Federal Government, assuming, of course, that sufficient supervision was necessary to insure that the standards were honestly applied.

Mr. Steele. I believe that in many States, and ultimately in most numbers of that kind could be developed.

The Chairman. Mr. Steele desires to ask a question.

Mr. Steele. Professor, I did not finish on what I started out to say. Can you have the number of days that each one of your men are out of Washington, have you not?

Mr. Anderson. I have no such statement compiled. I can compile that statement.

Mr. Steele. You also have the traveling charges of those men?

Mr. Anderson. Yes.

Mr. Steele. I would like to have you insert in the record the cases of the men with regard to this entire appropriation for the fiscal year. I do not care to do. What I am trying to get at is, of this number of employees outside of Washington and the traveling force.

The Chairman. You can have that, Mr. Steele, in a publication for the fiscal year. What you are driving at, I presume, is on this year?

Mr. Steele. Yes.

The Chairman. We have it for last year in the statement of expenditures in the Department of Agriculture.

Mr. BRAND. It is difficult to make an abs
itures outside of Washington from those i
close estimate shows that about $124,000
Washington during the first seven months
Mr. MCLAUGHLIN. How is it a matter
waste, tensile strength, and bleaching quali
and classes of cotton in order to determ
That is in item No. 41. We have not reacl
in line with what I had in mind—that so
being done here are not marketing propo
be directed by Congress.
The CHAIRMAN. Congress directed that
We appropriated for it in that manner, t
Bureau of Plant Industry to this office her
the knowledge of the tensile strength of
important factors in the marketing of cot
Mr. MCLAUGHLIN. It is not a marketing
The CHAIRMAN. I think it would be al
think so, Mr. Brand, as an expert on cottor
Mr. BRAND. It is essential information i
and, in addition, it is essential informati
the standards. We are unable to finally
without these tests as to grade, strength, a
The CHAIRMAN. And your standards a
the economic and scientific distribution of
Mr. BRAND. They are an essential featur
Mr. MCLAUGHLIN. That is true as to e
of the ground.
The CHAIRMAN. That is true as to all st
coming to it. You might as well make up
Mr. BRAND. We must have these tests ir
ards true standards; and the market valu
tors.
Mr. MCLAUGHLIN. Then we will have to
ing proposition and test the seeds of all l
the breeding of all animals, and all that, a
because all of those products finally reach
The CHAIRMAN. That is just what we ar
Mr. MCLAUGHLIN. As a marketing pro
The CHAIRMAN. We are doing that u
Bureau of Animal Industry is testing o
the Bureau of Plant Industry is testing see
things. This proposition is to take up th
tributing end of it.
Mr. HEFLIN. And you have been appr
purpose every year.
Mr. MCLAUGHLIN. Yes, sir; but I do
proposition I have favored it. It does not
ing proposition.
Mr. HEFLIN. They have been carrying
congressional aid for many years.
Mr. MCLAUGHLIN. And let it be prope
officers and under the proper head; but thi
up of the work.

he CHAIRMAN. Mr. McLaughlin is not criticizing the work; he is cizing the division of the functions of the various bureaus of department.

r. MCLAUGHLIN. It is not a marketing proposition, in my view, ll.

r. RUBEY. Referring to the questions asked by Mr. McLaughlin Mr. Anderson about these rural organizations, cooperation, etc. sire to call attention of the committee to the fact that this is an e of Markets and Rural Organization, not entirely an office of kets. Congress has said that you must go into and study and st in the development of rural organization, and you are doing ?

r. BRAND. Yes, sir.

r. RUBEY. And you are doing it in these cooperative associations you are working with. I just wanted to bring out that.

r. MCLAUGHLIN. In the organization of boys' corn clubs or in organization of cow-testing associations?

r. RUBEY. In such organizations as would lead to better market- facilities; that is the work of this office. This office is cooperat- with the view of securing better marketing facilities for the lucts after they have been produced, and these other organiza- s—the boys' corn clubs and the girls' clubs—are for the purpose roducing better crops and better hogs and all that sort of thing.

r. MCLAUGHLIN. My idea is that they are going back of that. t is all right, Gov. Rubey, but here we are going away back, if ollow it to its legitimate end, to the very beginning of the grow- of the crops.

r. BRAND. No; we do not.

r. RUBEY. I think Dr. Brand has brought out the fact that these erative organizations are for the purpose of securing better mar- ng facilities, in order that their stuff may be graded correctly, hat when it has been graded correctly it may bring a price that correspond to the grade of the product that is offered for sale.

r. BRAND. And there is no duplication of work.

he CHAIRMAN. You do not touch a crop of any description, as derstand your organization, until it is in a condition for sale?

r. BRAND. That is absolutely true.

there are no further questions, there is just one feature of this icular cotton-marketing work that we are carrying on to which nt to direct attention, and that relates to the selling of cotton in seed. As you all know, it is the ordinary practice to sell cotton r it is ginned, but there has grown up in the United States the tice, fostered by various conditions, of selling the cotton un- ed. People think they are getting just as much out of their cot- in that way. They have not the machinery for determining. ve have thought it was a proper activity to determine what the s are. I am not sure that you can see this from where you are ibiting box containing samples of cotton]. You can certainly he difference between this type and that type. Those two types sold on the same day in the Kingfisher (Okla.) market. This icating], a strict good middling bale, the better one, brought cents a pound, while the poorer one brought 10.10 cents a pound. other cases: These were sold on the same day, on November 20; bale sold for 9.65 cents per pound, whereas this one was sold at

1.61 cents a pound, a difference of 62
same market, on the same day. It
gamble, and the producer thereby
that way as the other way, simply
himself to determine the facts. W
on a wide variety of markets by
by following the cotton after gin
have ready for publication the fact
loss to the producer in selling cotto

After careful inquiry we estimate
a quarter of a million bales were
all our determinations of loss in W
to the grower due to this one mista

Mr. Young. You do not find that
you?

Mr. Brand. We have had careful
this year almost a million bales wo

Mr. Young. We have the largest
tion of the country it is the exceptio
seed. Frequently at the end of a
will not have enough seed cotton
We usually consider one-third of
When the farmer has a part of a
gin man or to some neighbor, but
that constitutes only a small fracti

Mr. Brand. Mr. Young is exact
of three and a half million to five
to our estimates, only 190,000 bales

Mr. Brand. The southeastern co
bales in South Carolina.

Mr. Hevlin. How many did Ala

Mr. Brand. In 1915, 42,000 bale

Mr. Casseler. And Mississippi?

Mr. Brand. 28,000.

Mr. Rubey. And Missouri?

Mr. Brand. 47,000, and almost th
in the seed. That is not a reflecti
new cotton-producing territory. I
reason for it, but when the facts a
will remove those obstacles.

Mr. Young. Cotton is sold in the
ties where gin facilities are poor to
this peculiar condition in Texas th
we obtained bad results. You ge
storm swept all over our State.
condition that the growth then on
weeks after that, cotton took what
in my section of the State it put
a great proportion of those bolls
they had matured sufficiently to op

Since I left home I discovered th
adjoining Ellis County the peopl
bolls, which are sold to men who
The only gin plant capable of hand

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shipping those unopened bolls over to Paris, and, of course, they hrough a process of removing the bolls and ginning the cotton. t probably would be listed as cotton sold in the seed, although is a condition that never existed in my State before, according ıy memory.

r. BRAND. I did not know that you had Ellis County in your dis-

r. YOUNG. Not in my district, but an adjacent district.

r. BRAND. There are 26 farmer-owned gins there, and it gives us of the best opportunities along this line of promoting better hods in marketing and preparation.

he CHAIRMAN. Your figures show 1,000,000 bales of cotton, apximately, last year sold in the seed?

r. BRAND. Yes, sir.

he CHAIRMAN. At an average loss of $6 a bale?

r. BRAND. Yes, sir.

he CHAIRMAN. Which means $6,000,000 loss to the producer for of investigation. This investigation you have made will be fold by a publication of these facts, so the people may be informed?

r. BRAND. To reduce that kind of waste, which we believe is based ely on lack of knowledge of the losses that occur.

r. ANDERSON. I would just like to ask a question for my own inıation. Why is it not easier to determine the value of the grade otton that is sold in the seed than where it is sold with the seed

r. BRAND. The cotton trade has developed no expertness along line of grading cotton in the seed. It is very difficult to do. e men say they can do it, but usually when the bale is ginned we find they have only given us the grade approximately, and eans a loss of anywhere from 10 to 25 or 50 points per pound.

r. RUBEY. I understood you to say that 42,000 bales in the seed sold in Missouri?

r. BRAND. 47,000 in Missouri were sold in the seed.

r. RUBEY. That would be an average loss of $6 per bale?

r. BRAND. Yes.

r. RUBEY. I just wanted to bring that to the attention of my ressional colleague who has the cotton in his district.

r. BRAND. That is all I have to say about this particular project.

r. HEFLIN. If the boys of the South were taught in the schools to grade cotton it would be of great value to the cotton grower?

r. BRAND. It certainly would, and that is the only place where an begin to do any teaching that is really going to take root.

r. HEFLIN. What can you do toward teaching the men how to e cotton by sending out bulletins?

r. BRAND. We do issue bulletins on that subject. We have gotten ne on the new cotton standards within the past two weeks, and ıave previously published bulletins on the grading of cotton h have had a very useful effect.

r. HEFLIN. Is this the situation: That the farmer can take the tin and study it so that when he sees a sample of his cotton, by ying that knowledge that you give him, he can judge pretty well her it is middling or ordinary or good ordinary or strict mid-g?

r. HOWELL. Not alone on cotton but on such products as wool, h is closely allied to cotton. The marketing conditions are some- t similar. I want to ask Dr. Brand if he has made any investi- n of the marketing conditions of wool in the West.

r. BRAND. Only to a slight extent, Mr. Howell, but we are hoping ng the current year to make a beginning. We are cooperating the Bureau of Animal Industry in that work, and they look to handle the standardization and marketing phases of it in co- ation with them. Right in that connection I want to say, with ence to some of Mr. McLaughlin's questions, that we do not lap. All of our projects are submitted to a project committee, if there is any overlapping in plan it is promptly halted at that t. We work together with the people who are doing the produc- work and do not overlap. If there is any overlapping it is very t, owing to making proper contacts.

r. HOWELL. The marketing of wool is a very large element of the The flock master shears his wool, sells it in the fleece, and ac- offers from various bidders. It seems to me to be a very un- tific method and that there ought to be a field there for the de- ment of better methods of marketing wool, and I would like ll your attention to that fact.

. BRAND. There is an excellent field, and when Mr. Hall pre- the work of his division on marketing live stock, meats, and al by-products, he will touch upon that question.

e CHAIRMAN. Shall we take Mr. Hall next?

. BRAND. If it suits your convenience, I would rather have the rative purchasing and marketing discussed next. That is the item in the program of work. We are asking a lump-sum ase of $18,690 for work relating to the improvement of market- onditions through cooperative purchasing and marketing, and l ask Mr. Bassett, who is primarily in charge of that project, esent the work under it.

EMENT OF MR. CHARLES E. BASSETT, SPECIALIST IN COOP- ATIVE PURCHASING AND MARKETING, OFFICE OF MARKETS D RURAL ORGANIZATION.

. BASSETT. Mr. Chairman, the project known as cooperative pur- ng and marketing has for its purpose the collecting and dissemi- g of information relative to the way in which producers can ve their condition by cooperating in the buying of their supplies n marketing their products, as well as the way in which the mers may cooperate in buying.

s work was started two years ago largely as a State investiga- although in charge of men who had had experience in coopera- rganizations as managers. There are in the United States over farm organizations attempting to do some of this work, and of umber about 2,000 are strictly cooperative.

ANDERSON. Right there, I would like to know what you call a tly cooperative organization"?

BASSETT. One conducted by the farmers for their own benefit ith profits divided on the basis of patronage rather than on the l invested.

These farmers' organizations during
of approximately $1,400,000,000. Th
little more clearly by a few charts whi
[An exhibiting chart] represents th
map of the United States, and these do
groups in the United States. We have
1,637 of these operators. They do an
and have a membership of 166,074.

Mr. STEELE. Iowa is pretty well rep

The CHAIRMAN. It seems to be gos

Mr. BASSETT. This one [exhibiting
and cheese factories and shows 1,708 ri
They did a business of over $83,000,0
141,786. You see their distribution

Mr. MCLAUGHLIN. You are putting

Mr. BASSETT. Minnesota is one of th

Mr. STEELE. Iowa is also pretty well

Mr. MCLAUGHLIN. What class of
ship of those organizations?

Mr. BASSETT. Farmers.

Mr. HEFLIN. In both instances, incl

Mr. BASSETT. I am speaking of coo
ative creameries.

In this [exhibiting another chart]
associations represented, and this incl
associations, doing a business of over
membership of over 108,000.

I have not attempted to show on t
organizations, such as cotton, tobacco,
is impossible to show them all.

But on this next chart [exhibiting
all of the cooperative organizations of
ing a total of 5,124 that have reported
know about. They did a business simi
over $700,000,000 and represent a
farmers and producers.

Mr. YOUNG. Of various kinds?

Mr. BASSETT. Yes, sir. You see, t
[indicating] and simply shows the dis

The work on this project is that of
ganizations already in existence as to
prove their machinery for doing busine
are founded upon rather lax business
not accomplished all that they might
this project to show those organiza
way in which they can improve their
ter business methods and by taking ad
such organizations that are partly coo
a capitalistic basis. The idea is to
istence primarily and make them ef
come a demonstration to other sectio
work. We would have a lot of succes
instead of building up on the basis of
outline of our project.

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e attempt to give all that information. Of course, a great deal is given in answering letters of inquiry based upon particular ls. Those are received every day—a score at least on an average.

. McLAUGHLIN. Have these maps been reproduced and pre- l to be put into publication?

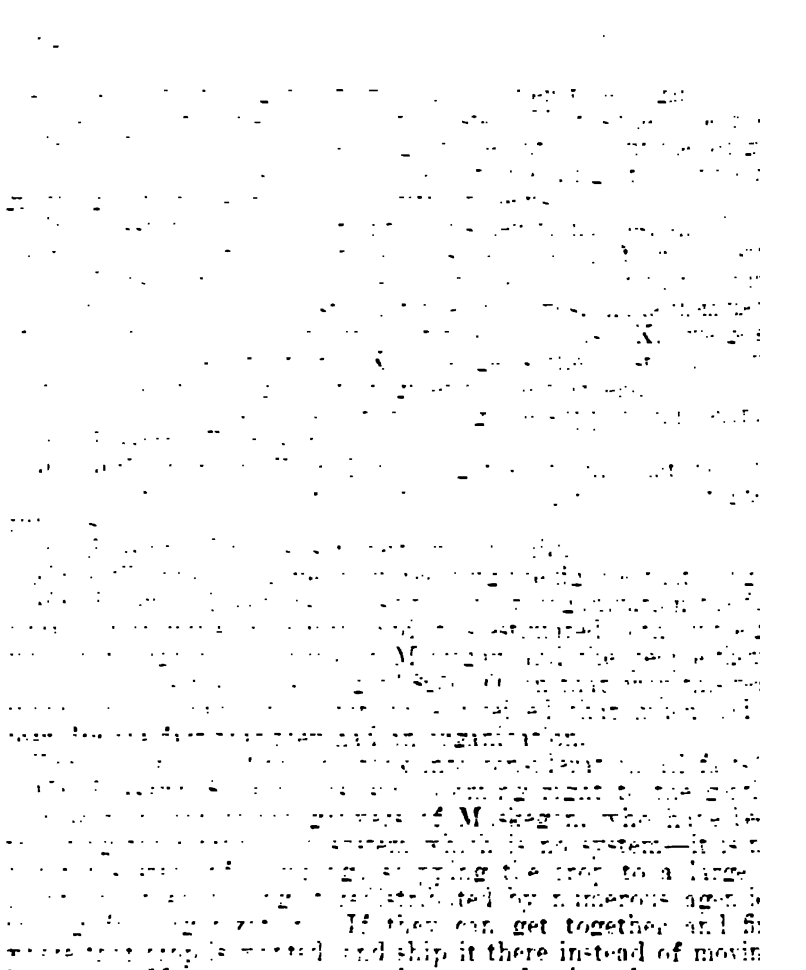
. BASSETT. Yes, sir; they will be issued in connection with cations on market business practice.

. McLAUGHLIN. What will that publication be called, so that if ne wants it he can get it?

. BRAND. The title has not been fixed, although the manuscript ll along in preparation. We always do send every member of ommittee a copy of our publications, so that you will receive a under any consideration.

. BASSETT. While a good deal of this work can be done by cor- ndence, the most important work has to be done by personal ct. In other words, the men in charge of this work must be tly connected with these organizations in order to be acquainted the local conditions and in order to give proper facts. You ot give advice at long distance. You have got to get acquainted local conditions. You have got to see exactly how they are do- he work. In that way you are in a position to give them advice. to what has been done and the way in which we work, I have ined the work we do by correspondence. We have some bulletins are fundamental; that is, they are based upon certain funda- l principles that we think are essential. Those people who are ring how they can combine and form new organizations, how can get together and improve their conditions, ask for this in- ation, and, where possible, we go and visit them; that is, we go elp them. We have done that in a number of instances.

instance, we will take Michigan. In Michigan the navy bean ers produce practically all the navy beans in the United States. were up against a condition that was serious. They were not med as to the crop or as to the market. The result was that naturally moved their crop at once as soon as harvested, and peculators took hold of it. There was a big wave in the price year. That wave was down as long as the growers owned the , and it would go up as soon as the beans went out of their pos- n. This last year, through the activity of this office, in coop- n with the Michigan Agricultural College at Lansing, the farm- ere sufficiently organized to get the information which was neces- for the marketing of their beans, and as a result, although the was very light this year on account of disease and weather condi- it is not far out of the way to say that they saved to themselves ss than a quarter of a million dollars on their crop because of the er of marketing it. The crop ordinarily runs $2,000,000. This it was much lighter, but on account of their knowledge of con- ns they were able to ask a reasonable price. This price was not sonable, nor did the asking of this price revert to the disad- ge of the consumer, because the consumer is simply paying a rice. Organization, in other words, does not mean price fixing mbination for the raising of prices. It contemplates the mov- f the crop from the producer to the consumer over the best led road with the least friction and the least waste. That is



Mr. McLAUGHLIN. Muskegon is my home city, and a great
Mr. BASSETT. Yes, sir.
Mr. McLAUGHLIN. When was that, and what response has
Mr. BASSETT. I made a personal visit there and placed
Mr. McLAUGHLIN. Two months ago?
Mr. BASSETT. Yes, sir. It was in connection with
Mr. HOWELL. Do you collect the figures on the product
Mr. BASSETT. We have to take the figures that are given
Mr. HOWELL. The Bureau of Crop Estimates?
Mr. BASSETT. Yes, sir.

YELL. And they are available to farmers and others?
SSETT. Oh, yes, sir. To go a little further, take, for in-
e work we are doing in the Northwest with the boxed
ustry. Right at the present moment in the States of
on, Oregon, Montana, and Idaho there are 520,000 acres
coming into bearing. They are at a long distance from
t, with expensive transportation and expensive methods of
for market. Those people were, in a "disorganized
" condition. They had numerous organizations which
ompetitive in any sense, unless you can use the word "com-
to describe cutthroat competition. They realize that the
ence of their industry depends upon a more orderly control
e efficient distribution of the crops in the Northwest. The
tives of the Office of Markets and Rural Organization are
n that problem and have proceeded far enough so that
of that section seem to feel that there is the basis for a
of hope.
AIRMAN. Let us see if we understand your remarks. You
hat the supply of beans is—you are dealing with perish-
ely?
SETT. Largely; yes, sir.
AIRMAN. You find out what that is, and then you try to
where the point of best demand is?
SETT. That is exactly right.
AIRMAN. How do you do that? What is your method?
SETT. We take into consideration all the producing sections
mmodity; the time at which that commodity is moved; we
ompeting sections; we find the consuming sections; and
the crop from the producing point to the nearest non-
point; that is, so as to get an equal distribution.
AIRMAN. The older members of the committee will recall
r eight years ago the testimony of the representatives of
a association in Virginia before this committee was to the
, while the city of Washington was in a state of compara-
ty with respect to peaches, was paying a tremendous price
es, and could get very few at any price, at the same
ccount of a congestion of freight, they were dumping six
arloads of peaches into the Potomac River down here at
a.
LAUGHLIN. Yes. And I have seen photographs of orchards
an with the fruit hanging on the trees frozen, the price
o the farmer not being large enough to justify the picking
les; and we know there are innumerable places, or were at
where the people were hungry for the fruit and paying
prices for it.
AIRMAN. Yes. You are attacking that problem?
SETT. That is it exactly. The lack of information as to
se peaches are wanted is largely the basis of the plight
. Mr. McLaughlin has described a condition that I am
with. I am a fruit grower from a region near his.
ividual fails to have that information; he can not afford
; costs too much money. So the basis of our whole market-
e, we feel, is the cooperation of farmers to secure that

Mr. McLAUGHLIN. You spoke of something

Mr. BISSETT. Yes, sir.

Mr. [illegible]. Will you explain that briefly?

Mr. BISSETT. [illegible] Ridgeway, near Trenton, S. C. [illegible] that they are in the Southeast. The growers there were in a [illegible] marketing that they were actually putting up their asparagus [illegible] as I [illegible] of asparagus. By giving them that all and showing them exactly how they might organize to grow their asparagus [illegible] be provided by the organizing [illegible] hold their industry and to make it profitable.

Now, in that statement I am anticipating somewhat. [illegible] work has only recently been done, but from the form of organization which has been perfected there, including, as it does, [illegible] per cent of the acreage of the green asparagus district of South Carolina, we think it certainly will give them a distributing system which will save the industry and make it somewhat profitable by replacing the present destructive condition that is really upsetting the whole business.

The CHAIRMAN. Practically all of the asparagus growers come into that organization.

Ir. BASSETT. Yes, sir. We had meetings at Ridgespring and nton. At Trenton we had 80 per cent of the growers in that ion.

he CHAIRMAN. You found Senator Tillman a large grower?

Ir. BASSETT. Yes, sir. Senator Tillman was away at that time, his son was there.

Ir. YOUNG. Along the Rio Grande section of Texas there is an n belt, is there not?

Ir. BASSETT. Yes, sir. That has been given some assistance but as much as we had hoped to be able to give it. There has been an enormous call for help. That will mean something in the ire. If we can develop the Northwest apple situation and save industry and show how the farmers can do that work, it is g to help the Maine potato growers; it is going to help the citrus vers of Florida; it is going to help the farmers of the South. ther words, it is a demonstration. We do not expect to carry to everyone. We can say to them, "Others have done it; you do the same."

he CHAIRMAN. Mr. Bassett, I think this is a wonderful work you lemen are undertaking. I have felt all the while that there was thing you ought to guard against (and I am saying this for the fit of Mr. Brand and your entire force here) and that is that you run so fast that you will get your legs tangled up and fall down ome proposition. Now, I think it is exceedingly important that do not overrun yourselves. I presume you have had that ex- ence as a boy. We do not want this organization to grow so fast it is going to tangle itself up and smash somewhere.

r. BASSETT. We have a pretty good governing force right us.

r. MCLAUGHLIN. If they are getting real results they can not get n too quickly.

ne CHAIRMAN. But you can appreciate how a new organization grow too rapidly.

r. BRAND. We have tried to guard against exactly that, Mr. irman, and we have never come before this committee without shing everything out and feeling absolutely sure that the funds were asking for would be well spent and would return large divi- ls to the country.

ne CHAIRMAN. I feel that way myself.

r. BASSETT. The work we have atempted to do in addition to t I have mentioned includes working with the cotton growers of lbourn, N. C. The question might naturally be asked whether ialists in organization work can handle the proposition, but we realize that cooperative organization is a power plant. We do deal so much with the details of the crop. The organization ishes the power to move the machinery, and the same power t for a cotton factory would do to run a steel plant up in sburgh.

r. ANDERSON. The fundamental principles, in other words, are tically the same whether you are dealing with cotton or with at?

r. BASSETT. That is the point. We do not enter into the details rowing the cotton, but we do know something about human

nature and how to handle it, or we think
handle those people so they can handle ther
The trouble with these organizations is t
on sentiment rather than on business. Too
ized just because it is a good thing to get to
enough of good business machinery into it t
when the first little bit of sand gets into th
The CHAIRMAN. Mr. Bassett, is the perc
erative organizations at this time as great
10 or 15 or 20 years ago.
Mr. BASSETT. No, sir. The great trouble
zations in this country in the past has been
tive stores. That scheme had a wonderful l
came a wonderful failure.
Mr. MCLAUGHLIN. Do you find any co
dealers of the organization of these coopera
Mr. BASSETT. There are some; yes, sir; b
in a proper way. If you can find a way fo
what he is hiring some one else to do, and
it is his business to do it. We feel that a
is on the wrong track. In other words, if a
body to sell his crop and through organiz
it better or cheaper, or both, it is his busin
that will serve him best.
Mr. MCLAUGHLIN. You spoke of selling.
Mr. BASSETT. Buying, if you please, coop
in which farmers may cooperatively buy
which are necessary for their farming. In
and storing up of material in a section for
fertilizers, or of binder twine, or whateve
arranging for the necessary finances at the
of a merchant who has to extend credit—w
tally correct, and we attempt to show how t
Mr. MCLAUGHLIN. Do you know of any
you who know anything about this so-call
industry and the binder-twine industry?
Mr. BASSETT. I do not know particularly.
is all. I know that this condition has been
years, sir.
Mr. ANDERSON. Not this particular mono
Mr. BASSETT. Not this particular one; no
Mr. ANDERSON. There has been, as I unc
and selling monopoly in this country, bu
monopoly in the sense in which it now exist
The CHAIRMAN. You have no evidence o
Mr. BASSETT. We have no evidence; no, s
Mr. BRAND. That is the subject which
newspapers is under investigation by the
We have not carried on any investigation.
The CHAIRMAN. This matter was refer
gentlemen from the Bureau of Plant Indus
Is there anything further, Mr. Bassett?
Mr. BASSETT. I would be glad to answer

. ANDERSON. You are able to go out among a bunch of farmers ell them what is the best plan of organization for the particular ose which they have in mind?
. BASSETT. We go further than that, sir. We draw plans for , and they are submitted to the solicitor of our department to ssed upon as to their legality. We absolutely draw the consti- n, by-laws, and plans of procedure and have those submitted to olicitor, who passes upon the legality of them.
. MCLAUGHLIN. Do you know anything of the result of that co- tive operation up at Traverse City?
. BASSETT. Yes, sir; I know considerable about it. They have nore or less trouble, of course——
. MCLAUGHLIN. They effected an organization in the spring of

. BASSETT. Yes, sir. Mr. Ellsworth is the manager.
. MCLAUGHLIN. In a general way, can you tell what they have

. BASSETT. They have done fairly well. They expect to extend operations to quite a large extent, and our office has rendered assistance in another project, but not in the organization.
CHAIRMAN. We are very much obliged to you, Mr. Bassett.
w, Dr. Brand, the next subject is market surveys, methods, and It is page 413 of the program book.

EMENT OF MR. CHARLES J. BRAND, CHIEF OF OFFICE OF MARKETS AND RURAL ORGANIZATION—Continued.

BRAND. The chief work under the project of market surveys, ds, and costs includes the following:
st. Studies of consuming capacity of large markets.
ond. Sources, movement, distribution, and price fluctuations.
rd. A study of the efficiency of marketing agencies, of which are many different types.
irth. Studies of the relation between prices and supply.
th. A comparison of marketing methods.
th. Survey of market services.
enth. Monthly reports of cold-storage holdings, of apples par- rly, which we hope to extend to other products as we are able e care of them properly.
the work on commercial production and movement during the ear we have given our chief attention, as I told the committee ould, to certain definite crops, in order to work out certain ples. The crops we worked with were strawberries, tomatoes, oupes, peaches, and, to a slight extent, Northwestern pears.
have mapped the areas of commercial surplus production in four crops, and have published four bulletins, the first of the that have ever been published in the United States, mapping ort of activity, so that you can refer to the map in the bulletin now the areas of commercial production of these four crops. ope to extend this work in the coming year to numerous other

have secured from the railroads, through their cooperation, tal car-lot movement from practically every one of their sta- for these crops—14,553 cars of strawberries, 11,995 cars of

fresh tomatoes, 16,401 cars of cantaloupes, a
which we have been able to locate as to th
fundamental information. If we are goir
and distribution, we have to know where th
and then study the natural outlets for it.

Mr. ANDERSON. To what extent has the
finding markets and making available inf
crop movements resulted in establishing a
the year?

Mr. BRAND. The work has not gone far e
with reference to general projects so that
that specific point. But we can say that
found that as the result of the work they
direct to consuming markets to a degree the
accomplish before. The tomato producers
Association found they were able to ship to
they had never been able to get into before.
by-product of a better distribution. I have
such a stabilization of prices has occurred.

Mr. ANDERSON. Have you made any stu
relative economic value of a stable price as
ating price?

Mr. BRAND. To a slight extent. We hav
nection with staple than with perishable pr

Mr. ANDERSON. I have a sort of notion in
economic proposition it is more desirable
form price throughout the year as possible t
ating from a high point to a low point, and

Mr. BRAND. We are getting information
the point of view you have expressed, and
of this more uniform and better controlled
will be secured.

Mr. MCLAUGHLIN. You spoke of learning
of thousand cars of different kinds of pr
very little value unless you are able to ir
them to the best markets. Do you know to
to influence the shipment of those particula

Mr. BRAND. Yes. We have had some
that respect, Mr. McLaughlin, through the
during the past year has been handled as a
the ensuing year we are attempting a separ
definite project of itself. Mr. Sherman wi
erable detail, so I am quite sure you will get
that point. We have been able through t
secured to guide the products to the market
in a far larger measure than has been the cas
particular products on which we have work

Mr. YOUNG. You spoke of the Jackso
Have you been called on in the past year by

Mr. BRAND. Yes; and we have had a new
A gentleman from Texas was in my office
extension of our work there. Of course, th
from the place where we have a groundw

so we shall carry on work again with reference to tomatoes in section and extend it to tomatoes in Mississippi and all the commercial tomato-producing sections. We have not yet looked after Florida crop.

The CHAIRMAN. Mr. Brand, I notice that in this particular project estimate a decrease of $10,100. Is that taken care of in the item collecting and distributing daily information by telegraph, mail, otherwise?

Mr. BRAND. Yes, Mr. Chairman; it is.

The CHAIRMAN. Now, who will present this particular item in detor do you care to have it presented?

Mr. BRAND. We prefer to go through the projects under the marketing and distribution item first, and Mr. Sherman will present later, if that suits your convenience.

The CHAIRMAN. Very well.

Mr. BRAND. Under this project we are also studying the consuming city of markets; and that, in part, is in the very direction that McLaughlin was speaking of—determining how much great industrial terminal markets consume. For instance, in the matter of very crops that we have specialized on, in order to complete current work with reference to them, we have found—of strawberries, for instance—that St. Louis consumes 1.85 quarts per capita; Kansas City, 3.15; whereas Boston consumes 10 quarts per capita. see the possibility of market expansion in markets where the consumption of particular fruits is too low. That is due to a wide variety of causes, but just calling attention to the facts stimulates distributors to go into the proper markets.

Mr. MCLAUGHLIN. That covers a series of years, does it?

Mr. BRAND. This covers a particular year, although we have also revised figures as to others, which are checkable, in a way.

Mr. MCLAUGHLIN. What year does this cover?

Mr. BRAND. That is the consumption for 1915. This work is going on constantly. Reports are coming in all the time and the data worked up just as rapidly as possible. In the matter of the per capita consumption of cantaloupes, we find that St. Louis consumes Chicago, 6.35; Kansas City, 7.68. Thus we can tell whether we suffering in certain cases from overproduction or underdistribution and we know where to begin to distribute, too.

The question of price fluctuation we are studying and have been studying during the past year through our market reporters. We kept market reporters in from 20 to 25 of the great markets through the perishable season. These men have carried on various activities. We try to combine all the activities we can for the sake economy, and, among other things, they have studied this question the relation between price fluctuation and the possible manipulation of supply, and things of that sort.

We have also been studying the costs, making analyses of the costs the distribution of specific carloads of things. We have traced carloads from production through to final sale to determine where costs are accruing, what the costs are, and whether they are reasonable or unreasonable. Naturally the amount traceable in the case given car diminishes very rapidly as you approach the consumer. In one case at least we were able to trace 96 per cent of the car-

Mr. [illegible]. That, as I explained last year, is solely on volunt[illegible] I [illegible] say this year that we have [illegible] I think, of the mill storages reporting, so that [illegible] There were 410 storages volunta[illegible]

rting this last month, so we are getting very much better in-
nation. There are not more than 600 in the country that store
les.

r. McLAUGHLIN. And do some of those refuse to report?

r. BRAND. Yes; the rest of them have refused. We have asked
l all. Some time we may suggest to this committee that it might
vorth while to give us authority so that we may require such
rts. That is proper information that should be in possession of
people as a whole. But we are getting all the results that we can
care of now.

iat is all I have to say on this particular project.

r. RUBEY. I want to ask you a question, Mr. Brand, and in order
ring it before you I want to submit an illustration in reference
e marketing of apples. I have in my home county a very large
e grower. He ships those apples to some market in a dis.ant
. He consigns them, we will say, to some man who distributes
. Now, his complaint is that the consignee makes a report to
of the sale of those apples, but he has absolutely no way of
ring up what he has done with them. He has sold them out to
ent retailers here and there. That is a situation that ought to
rrected in some way. I have thought of correcting it by having
passed by Congress compelling these commission men to make
ailed report of the sale of the product consigned to them, giving
ame and address of the parties to whom they were sold, to-
r with the price, so that the man who sells his apples and con-
them may have some method of checking up what has become
s product.

vant to ask whether or not you have got far enough along in
investigations to take up that sort of situation and what you
to suggest in reference to it.

. BRAND. That is brought to our attention almost daily, some-
many times a day, and we have given it a good deal of thought.
first remedy is uniform accounting methods for distributors
ed in any such handling of perishable products. Once we have
iform accounting system—which the railroads already have,
the Interstate Commerce Commission—which is thoroughly
icable, and believed to be practicable by the best commission
we will be able to check those things pretty accurately and very
ly, and it will be easy for those distributors in necessary cases
that information. We doubt the advisability of requiring it
eryone, because that makes a lot of work, where there is no
, but we do believe that it should be reached so that where
is abuse there may be reports.

. RUBEY. You can specify in the law that these reports shall be
when demanded by the shipper.

BRAND. Yes, sir; that is very easily handled.

. LESHER. I think the State of Pennsylvania has a law to that
In case you want that information you have a right to go to
books and get it.

BRAND. Mr. Mcomaw, one of our experts, is present. It is
le he may give some practical statement on that point if the
ittee cares for it.

STATEMENT OF MR. C. W. MOOMAW [illegible] PURCHASING AND MARKETING [illegible] RURAL ORGANIZATION

Mr. Moomaw. I might say that Mr. [illegible] an illustration of bad marketing [illegible] It may be possible for him to [illegible] soon merchant may make for [illegible]

Mr. Rubey. He tells me that one [illegible] shipment of apples to market and [illegible] knows he gets a great deal more for [illegible] consigns them, but it is not [illegible] shipment every time.

Mr. Moomaw. That suggests a difficulty with in marketing all the perishable [illegible] the commission merchant or other agency when a bad condition does not exist. [illegible] such cases is that if there is sufficient [illegible] community where the grower lives, he with his neighbor in providing for uniform [illegible] out of that community and for a [illegible] to the marketing. Just how that difficulty overcome otherwise I can not say.

Mr. Rubey. The gentleman to whom [illegible] fruit grower. He is a member of the Legislature and one of the best known fruit [illegible] ships out a carload of apples he knows [illegible]

Mr. Moomaw. But he does not know [illegible] getting?

Mr. Rubey. No.

Mr. Moomaw. He is personally unable [illegible] his shipment in the market, whereas if [illegible] organization with an efficient, experienced [illegible] probably sell that shipment f. o. b. shipping [illegible] Really, a cooperative organization [illegible] tion you can make to overcome such difficulties [illegible]

Mr. Rubey. Do you think it would be [illegible] compelling the commission merchant to [illegible] sales and furnish it when required?

Mr. Moomaw. I think such service on the [illegible] merchants is only just to the farmers. [illegible] claim in conducting these sales in the [illegible] quantities of perishable products that [illegible] are frequently made for cash and they [illegible] name of the party who buys. Just to [illegible] overcome I can not say, because I have [illegible] ing from the commission end.

Mr. Anderson. Is it not a fact that [illegible] the remedy for pretty nearly all of the [illegible] suggested here during the consideration [illegible]

Mr. Moomaw. In very large measure [illegible] tive organization can apply successfully [illegible]

unity grows products in sufficient quantities to justify the
of them in a wholesale way and to justify the employ-
perienced men to conduct the business.
AIRMAN. Cooperative effort has solved the problems of the
most of the other countries in which those problems have
d.
LAUGHLIN. What do you say in answer to my question
difficulty confronting the fruit growers in my district—
suggested Federal inspection at the point of shipment,

OMAW. There have been several demonstrations in the
. McLaughlin, as to what can be done by official or semi-
pection. I have in mind a large district in the Pacific
, one of the largest apple-growing districts in that section.
ed a law in the State providing for standards; that is,
of grade and pack before the shipments were made. They
at probably a great deal of their difficulty in the markets
their failure to put this fruit up in proper condition for
They found that out through organization. So the State
aw, and in this section they organized a league of the
enforce this inspection in the district. The State did not
at service; it was paid for by the shippers. The inde-
gents and the cooperative organizations in the district
set aside a certain sum per box to pay for this inspection.
ce has proven to be a guaranty to the trade, and it is
ey have been able to make very much better sales on the
f the guaranty and the State certificates which went along
rs.
LAUGHLIN. These organizations which you speak of could
te at large shipping points, and if inspection were made
thority it could only be at large shipping points. Is not

MAW. I do not know just what quantity of fruit is shipped
verse City. Mr. Bassett tells me it is a very large shipping

LAUGHLIN. But in a State like Michigan there are in-
stations from which shipments are made. I do not see
uld be possible to reach any considerable number of them
d of organization—by any kind of even local inspection,
ing of Federal inspection. Do you?
OMAW. It can be done in the commercial districts. There
fruit-growing districts, Mr. McLaughlin, where no great
of apples are grown, and those people will always have
because, in the first place, to be successful they must be
commercial producing districts and must ship in sufficient
to justify organization. Of course, it would be better for
icts if they could secure outside inspection which somebody
conduct, but, of course, it would involve tremendous ex-
he part of the Government if it undertook to inspect all
s.
pon. at 12.40 o'clock p. m., a recess was taken until 3

STATEMENT OF MR. CARROLL F. MOR
GRADES AND STANDARDS OFFICE
ORGANIZATION

ELE. Where do you raise those little sweet potatoes?
E. That shows the culls taken out of the better grades.
ELE. I say, where did you raise those?
RE. Those were raised in Arkansas. They are the size
sed for seed, however. One man who has graded sweet
a similar manner, but before these grades were adopted,
sful in getting $1.25 a bushel crate in St. Louis for them
, while the ungraded were selling at $1.25 for a 2-bushel
same market.
work has been done on grading, packing, and handling
les, and also on barrel apples. The barrel apple investi-
lowed the handling operations from picking time through
are in the car, to ascertain the best and most economical
picking, handling, grading, and packing. We must know
ethods, and also wish to develop the best possible and prac-
des.
is contemplated of the community packing-house method
apples or other products as compared with the individual
acking, to show, if possible, where the cost of preparing
t can be lowered or the quality improved. It is believed
ndling through community packing houses better results
ained than when the individual grower does the packing,
mostly at the present time.
mpt is made to show the growers through personal con-
spondence, and bulletins the need of better grading and to
better grading and handling. It is desired to make demon-
n producing sections along this line, and to carry the re-
ir investigations to determine the best methods right to
, or at least to reach him through his marketing organiza-
desirable to study the market receipts in the larger cities
at sections are practicing efficient or inefficient methods in
aration of products for market, and see to what extent the
reported by the dealers are due to the lack of proper
n. It is thought that publicity concerning this waste on
ts would help in encouraging better methods on the farms.
lt of these studies has been to develop information on this
d handling of perishables, some of which is now available.
be available as time goes on to aid our many growers to
pare their produce for market.
s have been prepared on "Marketing Maine potatoes" and
ons for parcel-post marketing," showing standards that
used by both producer and consumer in dealing under this
ket system. Another bulletin on the "Commercial grading,
nd shipping of cantaloupes" has been published, and simi-
as on potatoes and barreled apples are being prepared.
rk in connection with packages includes investigations of
barrels, crates, hampers, and various other packages used
products. It has been carried on in the produce sections
arkets. Some very interesting and valuable results have
ed by working with the package manufacturers' associa-
are also working toward the standardization of these pack-
iminate the short and unnecessary packages, and to arrive
standards for containers for perishables.

[illegible]

what you have in your mind. Now, the potato growers that
in mind have potato planters, and then they have potato
rs. That work is done by horse power. Then they have a
digger that digs the potatoes and elevates them right up into
igon, and the wagon starts off to the car to be loaded, 5 or
es away. How would it be possible for them to grade those
es?

MORE. It is being done very successfully in a number of sec-
In Florida this year probably 60 per cent of the potatoes out
Hastings section were graded over a grader into three differ-
es. In this instance they were machine-graded as to size, and
ere at the same time graded as to quality. But those potatoes
in over either power graders or hand graders.

STEELE. Have they such tools there to grade these potatoes in
s they are elevated from the ground to the wagon?

MORE. The potatoes there are dug by colored help.

STEELE. That is all hand work?

MORE. They are picked up by colored help.

STEELE. Yes.

MORE. And then they are hauled to the grading machine and
. They drop off the grader into the barrels, they are then
up, and then they go right to the market.

STEELE. That might do in some sections where you have small
but in the localities I speak of they do it all by machinery.

MORE. That is, the digging and handling?

STEELE. Yes.

MORE. The largest producing sections mostly are the ones that
ing to the mechanical graders—the Minnesota and Wisconsin
s, Maine, the eastern shore of Virginia, and the Florida sec-
One association on the eastern shore of Virginia purchased
160 machines this past year for its growers. Market demands
oming such that growers or shippers must grade not only for
but for size.

s speaking of packages. Here are baskets sent in by a manu-
r recently, asking that we test them as to capacity. He said
ere intended for 4-quart baskets, and I think he was honest
ving they were 4-quart baskets, but they tested only from 3¾
o 3½ quarts each. The basket manufacturers themselves are
to agree on specifications for various packages. We are
g with them on that point to eliminate the undersized short
es.

HOWELL. Would any one selling fruit in those baskets be liable
he pure-food law?

MORE. He would be liable only under the net-weight amend-
the pure-food law. If he marked them "contents, 3½ quarts,"
r, he would be in the clear.

manufacturers of Climax grape baskets have agreed on three
d sizes and also on specifications for this basket and for straw-
askets. They will probably come to Congress and ask for
l legislation making those packages standard for the in-
We have secured data from large shippers and associations
g their grading and packing methods and the packages used
eting. These data are from firms in various parts of the

rent types of packages in the one car makes the loading difficult also causes confusion in marketing.

he CHAIRMAN. Please take up your next line of work, Mr. Brand, marketing and distribution. I note you want an increase of 71 in that work.

r. BRAND. I would like to ask Mr. Branch, who is in charge of work, to present it to the committee.

here is a point in connection with standard containers that I ld like to emphasize. In the past there have been standards; le have agreed voluntarily upon standards; but just as soon as was an agreement and a particular standard began to be used, out any legislative compulsion, the business advantage of selling pounds of grapes instead of six for the same price became so rent that some one immediately broke away from the standard. I think, may emphasize the answer to the question that Mr. erson asked. You have got to have a definie law on the subject, e twentieth man, as Prof. Ely calls him, will take advantage of ituation. His dishonesty will force all of the others to begin ediately to compete by short weight, short measuring, and that of thing.

rill ask Mr. Branch to present the next project.

EMENT OF MR. G. V. BRANCH, IN CHARGE OF CITY MARKET-G AND DISTRIBUTION, OFFICE OF MARKETS AND RURAL GANIZATION.

. BRANCH. The object of the project, "City marketing and dis-tion," is to consider the problems of marketing and distributing products that are peculiar to our cities, mainly larger cities; courage the use of the best methods, and to help our cities n efficient and economic systems—possibly municipally owned ms—to aid in efficient distribution.

. ANDERSON. What do you mean by municipally owned systems in the distribution; municipal systems of distribution, or what?

. BRANCH. So far we have confined our work to encouraging the cipality to afford ideal facilities at a very low cost, these facili-o be used by the trade in their work—simply to help them to ncy, in other words.

. ANDERSON. What kind of facilities do you mean?

. BRANCH. Specifically, wholesale terminal markets, to bring the sale produce business of a city in better shape than it is in our ge city now; municipal retail markets, either open farmers' ets, or inclosed. or a combination of the two, and the wholesale rs' markets. We simply advocate at the present time that the id in furnishing good facilities at low rentals, not aiming to a revenue from those facilities, but simply giving the pro-s or dealers good equipment with which they can carry on their eting work more efficiently—equipment which as individuals would be unable to afford.

ANDERSON. Then you are not aiming at giving a municipality opoly of the market operation?

BRANCH. No. The question is often brought up, and some would like to see. of course, the municipality enter into the

[illegible] marketing work, competing with established [illegible] of producers, but our work so far has not [illegible]

Mr. [illegible]. Take, for instance, Sioux City, a town of [illegible] and a very fine man there who was on the [illegible] undertook to establish a farmers' market [illegible] There was considerable interest manifested [illegible] and after a certain time in the morning [illegible] and the people who desired to [illegible] and buy them. That was under [illegible] and, of course, then [illegible] from that morning [illegible] and the [illegible] and return again. [illegible] last year there [illegible] the [illegible] Now, if you have got [illegible] that market in Sioux City, organized [illegible] get more [illegible] We would like to have that done, but [illegible] the energy [illegible] we have put into this [illegible] to accomplish it.

Mr. LESHER. In our section it is just the opposite. No [illegible] to the market in my town. It is just ex[illegible] In some of the towns they have the market h[illegible] market house can not accommodate all of the produce [illegible] want to go into it, but they do not need to go into the ma[illegible] unless they want to. They come and sell direct to the cons[illegible] the consumer carries the produce away. It is a cash prop[illegible] the way through, and you do not need to encourage them

Mr. SLOAN. We have spent a lot of time and energy t[illegible] that kind of a market and have not succeeded.

Mr. LESHER. In my section of Pennsylvania, that is t[illegible] do it.

Mr. RUBEY. I was up at Gettysburg at the reunion in 191[illegible] morning about half past 5, when I came out of my cot in m[illegible] went uptown on the square for the purpose of getting so[illegible] eat. I walked all around there trying to find a restaurant [illegible] not find any. While I was standing there wondering wh[illegible] going to get something to eat, a gentleman came up and[illegible] ring a bell, and I thought there was a chance, so I followe[illegible] low about half a block. He went into a building and [illegible] after him and said, "Is breakfast ready?" He looked [illegible] astonishment and said, "No; what do you think this is? [illegible] "I supposed it was a restaurant," and he said, "I am not [illegible] hotel; there is no breakfast here. I was opening the [illegible] walked out at once and saw all the wagons coming and [illegible] to the curb, and the women and girls coming from all par[illegible] at 6 o'clock in the morning to purchase their produce.

Mr. LESHER. In my section they make them remain t[illegible] 9 o'clock. They can not peddle on the streets. They dar[illegible] until 9 o'clock.

IRMAN. Which leads me to remark that we have a very big
ith very, very different ways of doing different things, and
he necessity for some clearing house or centralization and
ation of uniformity in methods.

NCH. The incidents which these gentlemen have brought
admirably to show why a great many cities have asked
ice along this line. The tendency of the consumers is to
ail market, while the growers more often want a whole-
et, since many times they can not afford to spend the
s necessary to sell at retail. One has to consider the pecu-
every city, and in this particular work that we are doing
been doing, when we are called upon by a city to help
our business is to go there and make a survey of their
tions, come into contact and get in touch with all of the
actors that enter into the proposition, and try to draw
nclusions from these factors as to what is the best type of
them to have.

consumers in certain cities ought not to have any market
ie spirit of the tributary producers is not right and they
t to support it. In that case it would be foolish for a city
lot of money in building a market. I might point out
dison, Wis., they built a $55,000 market. It was off to one
city. They forgot, or possibly did not know, that location
he prime factors that governs the success of a market, so
to one side of the town. They have their $55,000 market
eldom have had anyone in it. At least the patrons have
nd the caretaker is about the only one that is seen around.
ws that the city, by ignoring this factor of location—and
at that is one of the most important factors entering into
ture—has wasted its money. Municipal markets in quite
of other cities have proven disappointing because of the
ake the factor of location into consideration.

part of the work we do, which we call "city service work."
ty is ready to do some constructive marketing work we
do it in an efficient way.

ERSON. Does your marketing proposition extend to the
of milk?

NCH. No, sir; it does not. The office has another project,
eting of dairy products," which takes that up.

conducted our work so far in about 20 cities in about 12
tates. The large farmers' markets at St. Louis, Mo., and
, R. I., in the establishment of which we have lent aid,
orking satisfactorily. In these cities the producers them-
their markets, having established them because they could
cities to give them adequate facilities—facilities which
cities really would do well to afford. Consequently the
nded together and started a cooperative market of their
formed a stock company, purchased land in the city, put
and now run it as a farmers' market, controlled by the
emselves.

ington, W. Va., as a result of some of the work we have
they have recently put in a $30,000 market on the lines
ecommended. Since it has just been opened during this

a commission man or a wholesaler and let him sell or dispose
ıe produce?
r. Howell. I am asking what evils have been revealed by the
rience of trade. Do the people get what they want?
r. Branch. No, indeed, they do not; neither the man who is pro-
ıg the stuff nor the people who are buying it.
r. Howell. If they can not supply the wants of their customers
have mistaken their calling, if they are the experts that they
t to be, by devoting their life to that sort of business. They
t to understand what their customers want if they are anxious
ake good.
r. Brand. I think Mr. Howell's question is as broad as the whole
of marketing, and it is impossible to answer him in one single
nce. Mr. Branch came from the angle of trade that Mr. Howell
s to, Mr. Branch having been a broker and distributer, distrib-
as much as 17 carloads a week, and if he would answer
stly he would say that he believes that there is a great deal of
sty in our present system and an opportunity for a great deal of
ovement also.
r. Howell. What I am trying to get at is that the business as
ists to-day is the result of the experience of the most able men
e business. You are bringing in a lot of men who are without
business experience to inaugurate a system of business different
what has been found to be good by the experience of genera-
, so to speak.
e Chairman. Not necessarily so. Would you agree to that
osition, Mr. Branch?
r. Branch. No; I do not think so.
e Chairman. It is not your business to change any system. It
ur business to improve systems, and to take systems which are
ıdapted to one section, that might be adapted to another section,
arry the system there and demonstrate it, as it were.
r. Howell. But in the final analysis, isn't it a fact that they all
ooperative? A man who takes up the business of distribution
his part in the economy of the world. A man who produces
his part. Every man has a different function to perform, and
vhole scheme of production and distribution is cooperation in
nal analysis.
r. Branch. In its very broadest sense we might call it coopera-
but when we consider the details——
r. Rubey (interposing). Is it not a fact that under the old
ods which you have described the distributor often gets more
f the product than the man does who is on the farm, and is not
one of the evils and inequalities that we are trying to remedy?
r. Howell. The men who are doing retail business make a very
living; very few of them get extremely wealthy. They carry
eir business for a lifetime, and they work for themselves often
ıer than they would work for anyone else.
r. Rubey. You are not speaking particularly of the fellows with
ı you are acquainted?
r. Howell. I am speaking of the whole body of retailers.
r. Rubey. Statistics show, and the former Secretary of Agricul-
Mr. Wilson, in one of his reports some years ago called atten-
to the fact that out of every dollar's worth of products sold the

producer who sells on p
producer, and he perfo
He not only performs the producing funct
function to the retail market, and the reta
a profit out of all three of these thi
If he did not he would not be able to sell it at all. In other wo
the stuff would rot on the ground, in many cases, if his only o

s to ship it into a general market. It enables the small producer ell his product which otherwise would go to waste.

Ir. HOWELL. It would be an economy to him to sell it in the ket?

Ir. BRAND. Yes, sir; that is where cooperation comes in.

he CHAIRMAN. In my own county, coming through my little n, they have established a new enterprise, which I think is going levelop very rapidly. They have established a produce route has a circuit of about 20 miles. This man has an auto truck. goes out in the morning and collects eggs, butter, and a little t and vegetables and gets it back into Columbia for sale maybe in the afternoon or maybe early the next morning. Then, in ition to that, he brings out a side of bacon or a pound of tobacco can of soda or a few matches for the people along the route. , I think that is the kind of marketing that is going to revolu- ize things in that country. The man is making a good living and he same time he is taking from the farmers on that route many, y things and bringing them back many, many dollars that would rwise go to waste.

r. STEELE. Does not that naturally develop as you observe an ortunity to go into business? Is it necessary that this Govern- t shall be the custodian of each and every individual in it and him when to get up in the morning, when to go to bed at night, just what to do all the time?

r. HOWELL. We have heard a great deal about the great economy ie parcel-post system. Now, as a matter of fact, that is the most nsive way of reaching the consumer that we have, and yet we heard it said time and time again that it is going to be an ense saving to the country. It costs ten times more to transport luce by the parcel post than in the regular way. We have heard eat deal throughout the country that the parcel post is going to n immense economy. What we ought to try to do is to sys- tize and save rather than increase the cost of distribution.

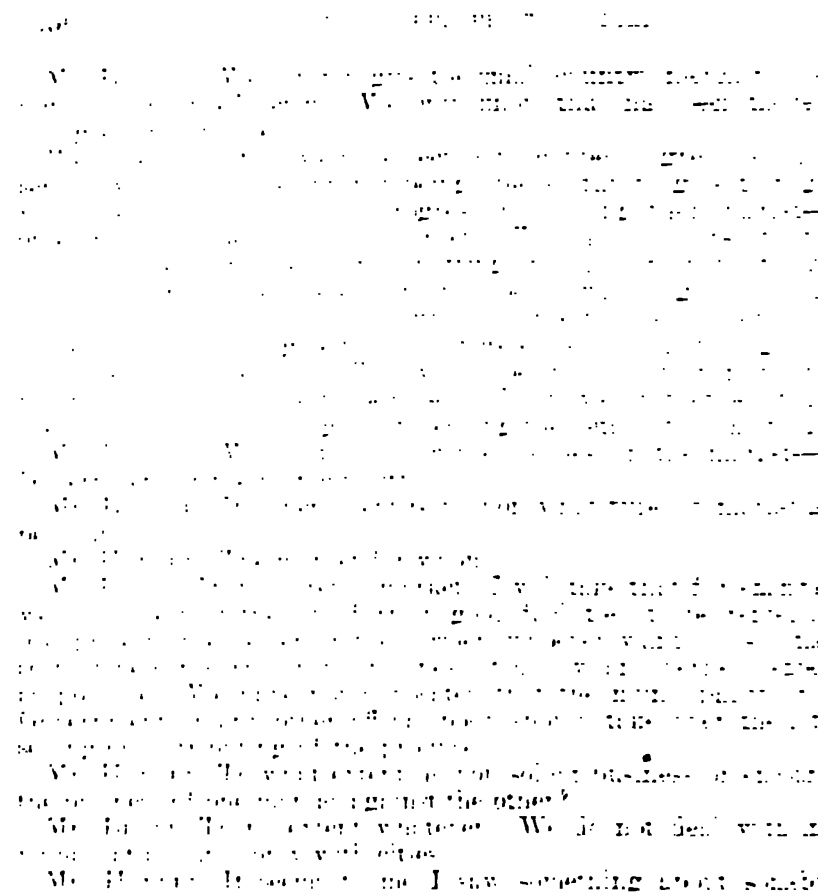
ie CHAIRMAN. Suppose we let Mr. Branch tell us what his idea is.

r. BRANCH. I believe the gentleman here fails to recognize the rence between local production in small quantities and larger luction which can be shipped advantageously to a regular dealer sold advantageously by him. The parcel post, I may say, has r been recommended, to my knowledge, for large quantities, h it would be cheaper, of course, to ship in larger packages and ugh the regular channels of trade, but it is for the miscellaneous that probably never would leave the farm were it not for this el post.

r. HOWELL. May I ask you what has become of all this produce re?

r. BRANCH. Lots of it has been wasted. A small part of it has taken to the little country store and exchanged for staples. Take , for instance. The storekeeper has held eggs there, collecting for possibly a couple of weeks or more, and finally, when he had cted enough to make up a case or two, he has shipped them to ket, where it is found that they are mostly rotten. The store- er gets poor returns and probably suffers actual loss.

r. HOWELL. I do not think much of a merchant who would hold that long.



Mr. Bryson. I am sure that does not refer to our work.

Mr. Haugen. In your work what do you do for the farmers help them dispose of the agricultural products which they raise?

Mr. Bryson. We very rarely do anything specifically for the individual farmer. We must work in a broader way.

Mr. Haugen. Do you have anything to do with suggesting as how to ship goods and things of that kind?

Mr. Bryson. Yes; we do, both with reference to the standard c tainers to the trade and parcel-post containers. We recomm type, but we do not carry it to the extent of going out and help the individual dispose of his product.

Mr. Haugen. What benefit can this department be?

Mr. Bryson. Mr. Howell has presented a very strong argument favor of the gentlemen who are very efficient in distribution. M of them are very honest and capable. The difficulties they have

due so much to dishonesty and inefficiency always as they are to
ck of standardization of methods and equipment and accounting
all of that sort of thing. We believe that those men are doing
ibly that section of the work which they set out to do, but they
aselves are of the opinion that there are many improvements
could be suggested in their business. They assist us and co-
ate with us in telling us of the improvements which might be
e in their particular business, and we thus become the repository,
were, of their combined experience and are able to give the
er number of people the benefit of that experience. We have
heartiest support, I might say, of the distributing trade that
erates with us in every way, to the extent of giving us access to
books, assisting us in any experiments that we wish to conduct,
all that sort of thing. I think that answers what Mr. Howell has
s mind about the recognized methods of distribution. The work
Branch is discussing, however, is also recognized, but in a dif-
it field, relating to the small products surrounding the city
ilations, which are not, under present conditions, always reaching
narket. It is not dealt with efficiently in many cases, so that
eed a clearing house for information, as the chairman suggested,
that is what we are aiming at. The question asked by Mr.
ell is a very broad one, and I think it would be impossible to
er it in a few words.

. HOWELL. There is one thing that you bring to my mind.
e is a lady in the Bureau of Chemistry who says she is teaching
armers how to ship eggs.

. HAUGEN. We have several county agents who do that.

. BRAND. There is absolutely no duplication. In accordance with
eorganization plan, the work in that respect is cooperative work,
all the plans, before they are put into operation, are discussed
een the two bureaus. While a great deal of Miss Pennington's
is market work, it is the plan not to in any way duplicate her
nt work where it is going on. We work together and not sepa-
y on these propositions.

. HAUGEN. If there is no duplication of work, will you describe
wherein your work differs from hers?

. BRAND. Her work only goes to a certain point and omits a very
field of marketing and distribution of poultry and eggs. She
ling with it from the pure-food standpoint, much of it from a
riological standpoint; her work comes in contact with the
et conditions but ignores many marketing processes which we
le more particularly.

. BRANCH. Possibly I have given the impression that this work
to eliminate the established channels of trade. That is not the
it all. We are cooperating in every way with the trade. Take,
istance, the matter of wholesale terminal markets in an average
where the wholesale district is separated from any railroad ter-
l. Cincinnati is a good example. There are two main whole-
districts in Cincinnati, one on Front Street and one on Sixth
t, neither of them being within several blocks of a railroad
nal of any kind. Consequently a good share of the produce has
drayed or trucked to the stores from the several railroad yards
er the city.

[illegible]

Mr. Haugen. Would not this be the fact, that if a city ... terminal market the experience of the ... not all be brought to bear on this new enterprise would be very ... to them?

Mr. Branch. It certainly would. We want to help cities that ... growing now to grow along the right lines, so that they will ... all the features to develop.

Mr. Haugen. Do they contemplate a union depot there, and is ... possible to get them all together?

Mr. Branch. Under certain conditions; yes. That is especia... feasible where a city has a belt line. To locate a market on a belt li... was recently proposed in Chicago, so that every railroad will h... access to the market under the same conditions, is about the b... thing, in my opinion, that can be done at this time. That seems ... be the most feasible.

Mr. Haugen. I take it that many of these people own the prope... which they occupy and it would be a pretty hard matter to make th... get out and leave their own property and go to some other pl... and pay rent.

Mr. Branch. That is one of the things that makes it hard.

Mr. Haugen. Do you believe that they would let their prope... stand idle?

Mr. Branch. If you can show them that they can make m... money by changing their system of business and by going to ...

erminal, I do not think there would be much reluctance on their to make the change.

. HAUGEN. Have you been able to show the people on South r Street, in Chicago, that it would be a good business venture em to leave South Water Street and go to a terminal on the belt

BRANCH. I can not say that I have; but those who are inter- in moving South Water Street are doing work right along that nd a large percentage of the dealers on South Water Street are ughly convinced of the desirability of having a terminal just ave outlined.

STEELE. The desirability of it is all right, but can they do it? feasible?

BRANCH. I want to bring out an argument in favor of the ipality helping in such a situation. There has been a move on icago for two or three years past to bring South Water Street oint on one of the belt lines and make there a large terminal t. I doubt if there is a single member of the trade who would willing to agree that this would be a very desirable condition. eal was almost swung, but on account of the jealousies and es among the trade they could not get together on that proposi- which was being financed and managed by a private corpora- However, I do not believe there is a bit of doubt but what, if y had been back of that movement and the trade had known iere was a neutral party governing it and had not been afraid control on the part of the belt line that was interested or the al corporation behind it, the deal would have gone through and revolutionized market conditions in Chicago, which are now arful condition.

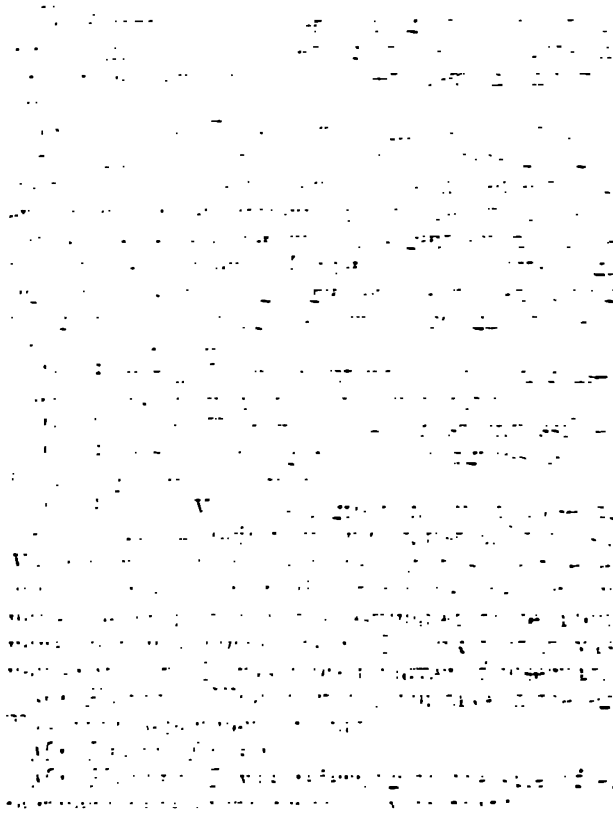
HOWELL. Was that inaugurated through your advice, or did ople themselves institute the proceedings?

BRANCH. That movement was initiated before our project irted, but we were called in later to discuss the plans, and I y well acquainted with the situation.

CHAIRMAN. We will have to hurry along, because several are here waiting to be heard.

BRANCH. I just want to mention one thing which we devel- st summer, and I believe it has great possibilities under cer- nditions. It is what we call emergency work in retail distri-

We find that the trouble in the free movement of products gely with the retailer, and last summer when we anticipated a t of peaches we tried, in cooperation with the peach growers, some way to stimulate retail distribution. After several con- s in New York City as to how best we could help, we finally about 33,000 circular letters to 40 cities in the 13 Northern stern States in which the largest markets of the country are , in an endeavor to advise these retailers of conditions; that is, ount of peaches coming and the desirability, from the stand- f profit on their part and for the good of the growers and the ers, of moving those peaches just as fast as they could be and under the modern methods which we outlined. This work h a great deal of commendation both from the retailers and ose among the wholesalers who knew of these efforts.



RANCH. I think you are confusing our work with that of Mr. ı, who is the local superintendent of weights, measures, and in Washington.
AUGEN. Has your bureau done anything for the people here?
RAND. We have cooperated with Mr. Sherman in his work e given him considerable assistance, but the work is actually ands.
AUGEN. What has been done in the city of Washington?
RAND. I do not think we could answer that. I think the endent of weights, measures, and markets would have to that question. We have given him advice and assistance r he came to us for help, but just what has been done we le to say with reference to Washington any more than any ıce.
AUGEN. Is he under your department?
RAND. No; he is under the District government.
AUGEN. Can you point to any other city where you have he people materially—where you have been of any material the people of the city in enabling them to purchase cheaper er produce?
RANCH. We can not point to that. We can point to the bene- ve have been to dealers and growers surrounding the city in he city furnish good market facilities for them, and, as a our survey of municipal marketing activity in this country, how you that cities which have these various municipal mar- ort very favorably on them in respect to retail prices being e goods fresher, and, in general, more satisfactory conditions ling the sale because of those facilities.
AUGEN. When you refer to markets, do you mean a type of of the same type as Center Market in Washington?
RANCH. We can use that as an illustration or can take, for in- arious other kinds of public markets, such as where farmers and sell at the curb or under steel sheds.
AUGEN. When you were speaking about South Water Street, ted to an entirely different proposition. I did not know just ı were getting at.
RANCH. I should refer to South Water Street as a produce ınd distinguish it from a municipally owned market.
OWELL. As a matter of fact, the production of peaches in this for the last few seasons has been practically a loss from a standpoint, has it not?
RANCH. This past season it was in most regions, I believe. ight have been a few regions where they made a little money

OWELL. I know that we produce the best peaches in the States in Utah, and the peach producers are all complaining have been doing business without a profit.
RAND. Mr. Chairman, it was due to just this kind of a prop- hat we went into this emergency work. We believe, if we mulate the moving of 500 cars, the $500 that it would cost ıve been money well spent.

[redacted]

[redacted]

[redacted]

tion is so inseparably connected with every phase of the
of every commodity that for a long time to come possibly
part of our work in transportation will be in the way of
ting work of the other sections. We have been acting,
, as the traffic bureau for the entire office. We have been
ke a great many contacts with the railroads and to bring
tter understanding, and I might say in some respects we
somewhat of a balance wheel, even in our own office.
e had the cooperation of the railroads, and without that
a much work that has been done in the office would have
ssible. Particularly are we indebted to the railroads for
ics of the amount and the volume of different classes of
es. It has not been possible to secure them from any
ce, and the temptation has been to attempt to secure the
information regarding many commodities. Had all such
en made at once, in many cases they would not have been
e us everything that we asked for. They have had to go
xpense to compile this statistical information which we
sted from them.
JGEN. What is the nature of that statistical information?
ITE. The statistical information—I refer more particu-

JGEN (interposing). Has it reference to rates?
ITE. Oh, no; it has no reference to rates. It is statistical
n as to the movement of different commodities and the
the movement. There is not in existence a great deal of
n as to the volume of production of different commodities.
been possible to get that information from any of the
l men or from any other source than the records of the
It will be brought out more particularly later on.
JGEN. Can not that information be gotten from the Inter-
merce Commission?
ITE. Their statistics are so very condensed that they do not
tail as to the different classes of commodities. The infor-
the Interstate Commerce Commission as to the different
es, for instance, is segregated under a few very general
he various products—animal products, agricultural prod-
orest products—as a whole. One item, for instance, will be
vegetables, and there is nothing to show which of these
are potatoes, which are peas, or which are corn, and which
its are oranges, which are apples, or which are peaches.
shows that the railroads of the United States for the fiscal
g June 30, 1915, handled a total of so many million tons
nd vegetables, but there is no information to show where
lucts originated nor what their destination was, nor is
information to show what, for instance, an individual line
or what it received from connecting carriers.
JGEN. Why is it necessary to have in the department in-
as to where a shipment originated and where it is going?
ITE. That will be brought out more fully in the discus-
e transportation and marketing of fruits and vegetables.
touch on the part we play in the securing of these statistics,
points of origin and destination and the total volume of

ice where, if they think it necessary, these matters can be taken
'or final adjudication. In other words, we do not attempt to do
the shippers what we think they should do for themselves.
r. HOWELL. I understood you to say that you had made several
rable contracts with the railroads. Did that have reference to
in the different parts of the country?
r. WHITE. Contacts. In regard to those requests for assistance
help in the marketing of some particular commodity, where the
pers think they are at a disadvantage in the matter of rates, we
just now handling a case from South Carolina affecting the
ragus producers. Sometimes a case arises where there is a real
ance in regard to rates. Sometimes it is a case where the pro-
rs themselves think they have reasons for not being able to
et their commodities successfully and have gotten the idea that
a question of rates. In some cases we have found that the
point of the complaint which is being made has already been
led only recently by the Interstate Commerce Commission. We
hose parties in possession of the facts and save them the time
the expense of attempting to carry identically the same matter
igh again, showing them where the commission has already de-
l the point, as is sometimes the case.
. HAUGEN. This information is supplied by the Interstate Com-
e Commission, and they could apply to the commission just as
as they could apply to you and get the information as to de-
is in rate cases?
. WHITE. Oh, yes; but these requests come to us in connection
other requests for information on matters relating to market-
where the questions of rates are involved. Of course, anyone
simply wants information on questions of rates or decisions
apply to the Interstate Commerce Commission and get those
ions.
. HAUGEN. And the fact is that they can step into any rail-
office and find the rates printed and on file there.
. WHITE. It is very frequently the case—too frequently, in-
—that the man who wants to know what a rate is does not know
e to go to find it.
. HAUGEN. Under the law they are required to keep a schedule
e in the office.
. WHITE. They are, but the man who wants to know that rate
not know what the law is.
. STEELE. But he asks the agent what the rate on a commodity
one point to another point is.
. WHITE. And maybe the agent can give him that information
possibly he can not.
. STEELE. Why can't he? He will give the rate.
. WHITE. He can give him the rate, but he does not always

. ANDERSON. I shipped my automobile, or, rather, I tried to
my automobile, and when I went into the office the agent gave
rate and I paid it, and before I got through I paid some more.
xperience is that about nine times out of ten the agent does
now the rate.
. STEELE. Can you give the rate on Mr. Anderson's automobile?

Mr. White. [illegible] necessary to know the rates on the different commodities [illegible] In that respect we are interested [illegible] of the Bureau to make a price list [illegible] making any charge or quote rates [illegible] If a man does not know where to go to get [illegible] charge [illegible] The practice [illegible] provision [illegible] the [illegible] [illegible] the [illegible] [illegible] the [illegible] [illegible] for the [illegible]

Mr. Harper. [illegible] railroad [illegible] your statements [illegible] here that the railroads [illegible] they only are doing [illegible] that has been attended [illegible]

Mr. White. [illegible] made but that the railroad [illegible]

Mr. Harper. That is what I have reference to [illegible] furnished the railroads attended [illegible]

Mr. White. In the furnishing of the [illegible] those commodities that we were telling you [illegible] the four crops that we took up this year [illegible] tomatoes and peaches.

Mr. Harper. Do you consider that any favor?

Mr. White. Without that information it would [illegible] lutely impossible to carry on the work.

Mr. Harper. Was it not the duty of the railroad companies to furnish the information as to the rates?

Mr. White. It was not a question of rates; it was a question of movement.

The Chairman. Take a specific case. I think I catch your meaning. Take up the cantaloupe business, Mr. White.

Mr. White. We received daily by wire from the railroads, at the expense of the Office of Markets a report showing the forwardings, for instance, of the peach crop. We received every morning, at 7:30 o'clock telegrams from the railroads in the producing districts, showing the total number of carloads of peaches that had been forwarded, segregated by destinations. We got those telegrams, commencing with the Georgia crop and going through until we got to the Pacific Northwest.

Mr. Brandeis. In order not to get too far into that, because that relates to another proceeding, may I say that all these arrangements with the railroads, which involve a world of detail, and a great deal of work on the railroads' part, were made by Mr. White's section, while the substantive work was carried on by Mr. Sherman's section. Mr. White made all of the contacts through his section.

Mr. Harper. And without that information you say it would have been impossible to carry on the work?

Mr. Brandeis. Absolutely.

Mr. HAUGEN. That is what is being done as to live stock and grain. ver you get this information what value is it to you? What do do with it?

Mr. WHITE. That was used in connection with the market news ion.

Mr. HAUGEN. We were told that favors of great value were ex- ed to the department. We knew where it came from but not t it was, and if you can not answer that, all right; just so it is ed up before we get through.

Mr. BRAND. It will be cleared up fully.

Mr. WHITE. Any request that is put up to the railroads emanating a governmental source immediately meets with some suspicion. ority among railroad officials is so centralized, and this was so ely a new thing, going to the railroads and asking for this in- ation, that it was absolutely impossible to handle it by corre- dence. Had we undertaken to do so, we would have still been sponding with the railroads about last year's strawberry crop. as absolutely necessary for us to go to the railroads and study organization, to find out what particular official had charge the thing on which we wanted information and get access to official, put the matter clearly before him, and show him defi- y that this was something that was not only for the benefit of roducers along his line but that it was of direct as well as in- t benefit to the railroads, both in increasing their tonnage and e matter of decreasing their claim payments; and when we got s to those men we stayed there with them until we got what we ed and got the instruction issued. It involved a great deal of l.

is map [indicating] will indicate the situation roughly. The ines show the railroads that we have interested in this work hat have been cooperating with us in it. It includes, I should not less than 225,000 miles, possibly 240,000 miles, of the total 52,000 miles in the country. These black circles here [in- ing] represent the most important of the cities where general s of railroads are located. As I say, it has became necessary s to go direct to these general offices and get in touch with the ls who handle and have jurisdiction over the particular thing we want. You can see readily the necessity for a great deal of l in connection with this work.

Mr. STEELE. The point is that you are advised as to the number of of cantaloupes, the number of cars of peaches, and the number rs of apples, and now you know exactly at what terminal point are going to go. As I understand, the object is that you are to know to-morrow or next week or at some particular time there will be so many cars of cantaloupes in New York City, so cars of peaches, and so many cars of apples; is that the idea?

Mr. WHITE. That is the idea; yes, sir.

Mr. STEELE. Now, when the car arrives at Omaha, you want to h out a certain shipment of apples that is going to New York. find the market glutted, and now you want to switch off to some cular point, so that you will have distribution at some place e they have not enough apples, say. That is one feature of your mation, as I understand it. Let us assume that the party who

Mr. Brown. Butter and poultry and things of that sort mov
you have outlined, but perishable products do not.

Mr. Harris. I think you will find that the commission
finance the shippers.

Mr. Brown. Very likely.

Mr. Harris. And they may finance them in this way.

Mr. Howell. The commission men need and get this infor
[illegible] the same as the producers do. They get the informa

he market is going to be glutted, and they govern themselves lingly.

HAUGEN. They take advantage of it.

BRAND. That is true, and they are our strongest supporters in 'hole matter, as well as the producers and the producers' or- tions.

HAUGEN. This enables them to buy products cheaper.

BRAND. The information is obtained through one central , and the best that can be secured is sent out.

re is one point I think Mr. White should develop before he des—the daily card report and what it is for?

WHITE. For the purpose of the market-news service for the g year, we have gotten the cooperation of all these carriers, ey have agreed to put into the hands of their local station at points where the 12 or 15 commodities which it is pro- to handle the coming year are produced, where they are d, or any one of them, a supply of addressed, franked postal for reporting to the office daily each car of any one of these dities which is forwarded. That information will be used in tion with the market-news service on the less perishable com- es. It will be taken up by mail. At the height of the season l ask the railroads to give us, as they did last year, telegraphic s of the more highly perishable commodities.

STEELE. Does not the commission man have that same report he railroad companies?

WHITE. No, sir. Under paragraph 6 of section 15, the car- n not give any private individual information concerning any nt that is in transit, as to the identity of the consignor or signee, or any facts that would give one man information another man's business, but officials of the Government are d under that clause.

HAUGEN. Then you get the information and you pass it on individuals?

WHITE. We give it in such a way that the identity of the ors and consignees is not divulged, nor is any transportation y given any information as to the business of any other rtation company.

HAUGEN. What information do you give that the railroads give?

WHITE. Railroads are not giving out any information.

HAUGEN. I understood you to say that they could not give it to vidual, but that they could give it to the Government officials, t they are giving it to you at this time.

WHITE. That is true, and even many things that would not te a technical violation of the law they refuse to give to the ual.

HAUGEN. But they give it to you?

RUBEY. They do not give the name of the shipper, but they e number of the cars that are shipped.

WHITE. They will not undertake, for instance, to give to any sion man the number of cars of peaches coming into Wash- to-morrow. They take this stand: "If we give it to one e will have to give it to everyone," so they do not give it to

Mr. White.

Mr. Hall.

The Chairman. In connection with the hearing, Mr. Hall, I think I made the statement that all of those [illegible] were [illegible] Mr. White is one small link in the [illegible] Mr. Sherman, who will follow, will take up from information that Mr. White has gathered. I think when we all of the carriers to appear before us and give us their story we get a pretty good picture of the work.

Mr. White. The only other point which I wanted to make in connection was that by reason of the fact that we have had previous with the transportation companies and know their organization and the methods of doing business, we have been enabled to get the information much more quickly than those who have had no such training. We have, it has been necessary to go direct to the central offices of the carriers, and it would have been absolutely impossible to have handled such matters as this by correspondence. I believe one on that work it would have been absolutely impossible to succeed without the cooperation of the carriers. They are not compelled to give us this information, but they have given it voluntarily and we thank them, knowing that it assists them [illegible] in every way.

The Chairman. And through you they assist the [illegible]

Mr. White. Yes, sir.

Mr. [illegible]

Mr. Brand. Mr. [illegible] progress of the work [illegible]

. HAUGEN. I understood Mr. White to say that you were giving lerable attention to cold storage in the way of suggesting the ing of cold-storage plants in the country.

WHITE. No; I referred to the work that was being done in arket survey section in regard to the cold storage of apples. As ter of fact, the work has been along transportation lines, and storage is a part of our work we have been able to go only inci- lly into it and give it only comparatively slight attention. A of the increase in this appropriation is asked for the purpose uring some one to handle this storage work, so that he can give ided attention to it.

HAUGEN. But you pay no attention to the storage itself?

WHITE. No; we do not.

EMENT OF MR. CHARLES J. BRAND, CHIEF OF THE OFFICE OF MARKETS AND RURAL ORGANIZATION—Continued.

BRAND. The next project is the one entitled "Miscellaneous ms in marketing and cooperation," which has been the parent t of several other new separate projects. The work in dairy ting and in grain, hay, and seed marketing and certain other ies were initiated under the allotment for this project. It is n that way. Our foreign market work is proposed under this vith reference to specific products. The project is not one is carried on in and for itself but rather as an originating proj- other activities. It is used in cooperation with other kinds vities, such as Miss Pennington's work and other work going he department, with which we cooperate. It is intended less for ng on cooperative work than for the origination of other lines k, and during the coming year we plan to give special atten- certain phases of foreign marketing and a consideration of arketing of wool to a certain extent. In that respect it will d to assist the marketing of meat, live stock, and animal by- cts. It is in a way a catch-all project, as its title indicates. wish to hear the plans that we have in contemplation under it, d be glad to go into it. They are general in character, and we ting for a much reduced amount.

CHAIRMAN. I want to ask you one or two questions. First you mentioned dairy marketing, and I would like to ask if ork would conflict at all with the work in the Dairy Division Bureau of Animal Industry?

BRAND. Not in the slightest. We work in the very closest ation with Mr. Rawl in his work.

CHAIRMAN. I guess we will take up these other items, "Mar- by parcel post and express."

BRAND. Mr. Flohr, who handles this work, I am sorry to say, ken seriously sick day before yesterday, and I am compelled to t it myself, although I am not as familiar with it as he is. are not proposing the parcel post as a panacea for all the ing ills, but rather, as Mr. Branch stated in his presentation, tally. It is intended for the marketing of small quantities of e by persons who would otherwise probably not have any out- tsoever, and I can state from personal experience with refer- it that there is a wonderful opportunity to develop that kind

of incidental farm business. I am a farmer myself in absentia, a I get my country sausage, eggs, and many other products from own farm by parcel post. I also use the parcel post to send thi to my farm, and I find it exceedingly satisfactory.

A large variety of products have been tested, something like 2. experimental shipments having been made, tracing the condition the container, the condition of the product, and all of the other f tors. Two bulletins have been issued on the subject, the first being on the shipping of eggs by parcel post, and I do not thinl is too much to say that it has resulted in a very wide extension the use of parcel post for egg shipping. I had one experience which two dozen were shipped, where the whole dozen on the lo tier were broken, but that was only one case in 30 or 40 shipments similar kinds during the winter in my experience. We have a gr many of these experiments where we trace the actual condition the shipment. That applies to other things as well as eggs, such cherries, lettuce, and things of that sort, which are very perisha In the case of lettuce winter shipment has been found thoroug practicable. It is very high-priced at that time, and you can aff to pay the higher postage. So we are looking at the parcel post an incidental method of marketing, but we are not suggesting, Mr. Lubin does, that the cotton crop ultimately will be distribu by parcel post.

Mr. HAUGEN. I take it that you have been experimenting wi hardy varieties?

Mr. BRAND. No; we have not. We have been experimenting wi regular commercial varieties, with respect to perishable as disti guished from imperishable products. Our bulletins on parcel-po shipping have been distributed quite widely, and we know that th are having effect on people who otherwise would probably waste great deal of good material.

Our men have admit cards, so that they are able to trace the shi ments and follow them throughout and see just what attention given to the products, and the Post Office Department is very great interested in this matter and accepts all kinds of suggestions looki to the betterment of the service. We are asking for almost no i crease in this item, so far as I recollect it now. I will be very gl to answer any questions which I may be able to in regard to t matter. I have not made any particular study of the question oth than what I have stated.

Mr. HAUGEN. My experience with the parcels post is that if y are satisfied with taking what you can get from the parcels post. you get it at all, it is good service.

Mr. BRAND. Our work is definitely directed to seeing that wh you get is what you want.

Mr. HAUGEN. I have made several shipments and have found th they were about a week or two behind and that the packages are a bad condition when they are received. Do you suggest shippi by way of parcels post?

Mr. BRAND. Yes; where it is a suitable method and where the are no economic conditions which would make other methods of ca riage preferable.

Mr. HAUGEN. Have you taken into consideration the fact that t Government pays more than 4 cents a pound on the average to t

ad companies for hauling parcels post, whereas the express
anies pay less than 1 cent, and that every recommendation made
shipment by parcels post means to pay six times the revenue
railroad company? Is it the function of the Government to
tise and aid the railroad companies to that extent, especially
hat this administration was so generous with them and gave
a 5 per cent increase against the decision of the Interstate Com-
Commission?

RUBEY. Is it not a fact that the Congress of the United States
ished parcels post?

CHAIRMAN. Some years ago.

RUBEY. Are you not accepting conditions as you find them?

BRAND. We take the two rates and compare them and compare
onomic conditions and we try to arrive at a conclusion as to
er a man ought to use one or the other; and we also recommend
press companies just as freely for certain products.

HAUGEN. Congress established the parcels post, but your de-
ent now encourages paying the additional $3 a hundred.

CHAIRMAN. Mr. Brand's answer to that would be that he is
nning the post office end of it.

HAUGEN. But he is running this bureau, and as such he is
ally an agent of the railroads in increasing their revenues.

BRAND. If we can help the railroads, we are not averse to doing
They help us a whole lot.

HAUGEN. It is for us to know what this money is being used
d if it is used particularly to advance anyone's interest at the
e of others I am opposed to it. I do not care whether it is
lroads or anyone else.

CHAIRMAN. Take up your next item.

BRAND. The next item is "Marketing live stock, meats, and by-products." That item is one in which we are asking for derable increase, $17,245. I will ask Prof. Hall to present that

MENT OF MR. LOUIS D. HALL, IN CHARGE OF MARKETING E STOCK, MEATS, AND ANIMAL BY-PRODUCTS, OFFICE OF KETS AND RURAL ORGANIZATION.

HALL. Mr. Chairman and gentlemen, the work in marketing
ock, meats, and animal by-products deals with the live stock
he time it leaves the range until the product reaches the ulti-
onsumer. We are dealing with a product that aggregates
ing like $5,000,000,000 in farm value, and the annual products
rth something like $3,000,000,000. In that connection I might
t the meat-packing industry is the largest single industry in
ited States, measured in terms of value of products. This
is peculiarly an interstate proposition, because of the fact that
k of the live stock is in the Middle West and the West, while
ing like one-half of the population of the country lives in
f of the area east of the Mississippi and north of the Ohio
Consequently there is a great movement from west to east,
explains why the principal market centers have been built up
cago and the Missouri River points and why the live-stock
s are moving westward with the population.

Mr. Hart. We

the

parties get

at the

matter.

Mr. Sterrett. Just please follow one

The Chairman. He can, not, gentle

Hart. having to go at home, a

and the

the

to the servants of the Govern

to do to protect them in such a

was trying to do, as well, and I would

further interruption.

Mr. Sterrett. He started off in anot

The Chairman. Well, let him com

he has completed it, if he has starte

can ask the question again. You can

you are breaking into his statement.

tion only about two or three years.

Mr. Hart. Let me illustrate the an

the first things we did in 1914, imme

of this project. Assuming that som

better than a lot of statistics which w

Bureau and from interviews with m

cided that we would go out and get s

tive shipments, and we went to 12

States or, I should say, to farms and

and selected lots of cattle on which

factory statements of the cost of prod

were ready to market.

We followed these shipments from

ranch, and in one or two cases the

ıd-up, in order to get that element of the cost of marketing.
lowed them to the stockyards, through every step of the
of marketing, and through the packing houses, to get the
slaughtering and refrigerating, as nearly as we could, and
ıe branch houses, and finally to the retail market. I am glad
red to me to mention this, because it brings out the fact that
not considering any one step of this process as the crux of
blem of marketing but that we believe there are improve-
ıat can be made all along the line from the time the stock
the market until the meat goes to the consumer.

TEELE. Well, you are on the round-up. What do you say that
improve? Let us just take a bunch of cattle and round them
ıat do you do?

[ALL. The assistant who accompanied the round-up, I think,
no particular part of that transaction which could be im-

TEELE. Give me your knowledge of a round-up.

[ALL. Of course, the round-up consists in providing a chuck
vith supplies for an outfit of cowboys, which starts out over
area of country, goes to the heads of the creeks and streams
y to the grazing region and gradually from time to time
he cattle down one day nearer to the loading point.

TEELE. What time of the year is this done?

[ALL. That is from August to November—the fall round-up
he beef round-up. The particular lot I mentioned was fol-
September or October from Montana to Chicago. The cat-
sold in Chicago and slaughtered there.

TEELE. Let us round-up these cattle.

'HAIRMAN. You are getting in the way, now. Mr. Steele, I
e to ask that you let the witness continue.

AUGEN. He wants to ask him——

'HAIRMAN. Mr. Steele, I will have to protect you from your
e. I want this round-up done right. I think they are pretty
nded-up now.

TEELE. What did you do?

[ALL. This was only one of 12 shipments. The rounding-up
very small item in the cost of marketing.

TEELE. It is not a very large item if you have a round-up
nd outfit?

[ALL. No, sir.

TEELE. In this round-up, after you have rounded all of these
p, A takes out certain brands, and they are thrown over
d B a certain bunch with his brand, and they are thrown
dicating]. Is that your idea of a round-up.

[ALL. That is true in some cases. In many cases the cattle
ent brands are separated at the market.

TEELE. I refer to the general round-up, and that is about the
y they do it. Each brand of each one's cattle is separated;
starts to market. Let us take him to market. Go on with it.
o see what he has to do.

'ALL. The next step is to load them on the cars and get them
et.

TEELE. Well, he has got them loaded up.

Mr. HALL. They are sent to his commission firm or to some one subject to order after they arrive at the market or to [illegible] route.

Mr. STEELE. Let us unload them. What do you do at the unloading [illegible]?

Mr. HALL. The stockyards company unloads the cattle and delivers them to the pens of the commission company.

Mr. STEELE. Yes.

Mr. HALL. And the commission company feeds, waters, sorts, sells and weighs the cattle.

Mr. STEELE. But what kind of cattle have you shipped in this shipment?

Mr. HALL. We have shipped ——

Mr. STEELE (interposing). You have shipped bulls and old cows, you have shipped heifers and calves and 3-year-old steers and 2-year-old steers.

The CHAIRMAN. Mr. Steele, you asked the witness a question and then you answered the question yourself.

Mr. STEELE. He does not seem to know.

The CHAIRMAN. If you will give him time, he may answer. The gentleman does not talk without thinking.

Mr. HALL. As I stated, we have endeavored to find representative lots of cattle. We have not followed the shipment of all of the kinds of cattle that Mr. Steele has mentioned. We have simply accompanied shipments of other people who have been kind enough to cooperate with us in giving us this privilege.

Mr. STEELE. He has gotten to these stockyards where these speculators are.

The CHAIRMAN. Let us get him to the speculators. You have got him to the chute and you have unloaded him. Go ahead.

Mr. HALL. I mentioned that the commission company feeds, waters, sells, and weighs the cattle and delivers them to the scales when the packer takes them.

Mr. STEELE. These cattle are sorted after they get in and then they are again sorted, are they not?

Mr. HALL. Yes, sir, usually, unless they are already sorted when they come in.

Mr. STEELE. These beef cattle are kept off in one pen, all the steers in another, all the horned cattle in another, the heifers and bulls in another, and the calves in another. They are classified, are they?

Mr. HALL. Yes, sir.

Mr. STEELE. By the commission men?

Mr. HALL. That is a part of the commission man's business course. I do not know just how much detail the committee would want relative to that part of the business.

Mr. STEELE. I want to know. You are asking for an increase of $17,245, and I want to know what benefit you are getting in this branch of the department.

Mr. BRAND. I do not think we will ever arrive at that unless we permit Mr. Hall to describe the different lines of work that you are carrying on which relate very little to the round-up and very much to a number of other problems.

Mr. HAUGEN. We are not particularly interested in the round-up

HAIRMAN. You are not, but your colleague is.
TEELE. The witness has gone out on a round-up. I want what he has found out, and I want him to tell me, if he can, nefits we are going to derive from his knowledge.
HAIRMAN. Let us agree here by unanimous consent that Mr. oceed for five minutes without interruption, and if in that has not said anything—if you gentlemen do not think he has d any information to you—then ask your questions. ([After] That is agreed to.
ALL. That particular line of work—the tracing of these ship- was part of an investigation that was carried on by direction nmittee appointed by the Secretary to form the basis of a n methods and costs of marketing live stock and methods and listribution of meat in the United States, and we made these just as complete as we could. Each man who was tracing ipments was thoroughly familiar by experience with the ns of the different stockyards, and we would be delighted to at this time, if you wish, all the details of the handling of ipments into the stockyards. It is difficult for me to know far to go into detail for those of you who are not familiar live-stock markets.
HAIRMAN. Those who are not familiar with it do not care out it. We want the general results.
ALL. As a result of those studies we compiled a report which nitted some months ago for the consideration of a committee been appointed by the Secretary. That was followed by a of lines of work, more or less remotely connected with the ive-stock market. For instance, a special report on the mar- f live stock in the South was called for last year on account epression due to the cotton situation in the South. Several ere spent there. A special investigation of the marketing tock in Colorado was made at the request of the governor on f a committee of citizens who asked that a representative be ook into the market conditions there, and several special lines of that sort have been carried on and presented in special

ntally, in speaking of the shipment of live stock to the cen- ket, I want to mention one matter which we discovered in e stockman can be of a great deal of assistance to himself in sections of the United States. I refer to the cooperative k shippers' associations. In Minnesota something like 200 associations have been formed. It is a new movement. t began in 1908, and I was told not long ago by a representa- the University of Minnesota that it was estimated that a f a million dollars is effected in Minnesota each year through ıcy of these associations. Several farmers, each of whom a few head of stock to sell and who formerly have had to ocal shippers, by the very simple arrangement of agreeing pping date and pooling their shipments get a carload. By ıg through that sort of an association they have saved all the n 25 cents to $1.50 a hundred on their shipments. We have study of that method of shipping and have prepared a bulle- h is now on its way to the press.

Mr. [illegible]

Mr. HALL. I [illegible]

Mr. [illegible]

Mr. [illegible]

[illegible] bid on my cattle?

Mr. HALL. The number of bidders varies [illegible] the different yards. I would like to answer that [illegible] that at the conference which was held at [illegible] of the Secretary of Agriculture, on November [illegible] Mr. Brand, Chief of the Office of Markets and [illegible] presided, it was the consensus of opinion of those [illegible] experience at that meeting that competition [illegible] materially diminished within recent years.

Mr. RUBEY. Now, I want to give you this illustration [illegible] been told. I do not know how true it is—that in the K[illegible] live-stock market, when a shipper takes his carload of [illegible] market, it reaches there in the morning and he puts it into [illegible] and he waits until 10 o'clock for somebody to come and bid on his cattle. Possibly nobody appears until 10 o'clock; then one man appears, and he can get only one bid upon his cattle has got to take that bid or nothing. Do you know anything that condition?

Mr. HALL. I have heard that mentioned a number of times have not investigated that particular thing first hand.

Mr. RUBEY. Mr. Chairman, I desire to read this letter record. I think this is proper, and I want simply to do it purpose of calling it to the attention of this Office of Market came up in my State. We had a week at our university a cultural college, known as farmers' week, and gave that various groups of agricultural people and discussed those which pertained to their particular line of industry. The li people stated, and I have this letter from the association State, dated Columbia, Mo., January 21, 1916, reading as fol

MISSOURI CATTLE, SWINE, AND SHEEP FEEDERS' ASSOCIATI
Columbia, Mo., January [illegible]

Hon. THOMAS L. RUBEY,
House of Representatives, Washington, D. C.

DEAR SIR: I inclose herewith a brief report of the sixth annual m the Missouri Cattle, Swine, and Sheep Feeders' Association, including the resolutions adopted by the association.

Stockmen of this State are very much disturbed over the misa market for fat cattle and hogs. Many are of the opinion that whol retail prices for packing-house products are not in their proper relati prices of live stock. They would like definite information in this ma seek a uniform system of accounting and publicity concerning the larg plants.

y have noticed in the Congressional Record of January 10 that these
s were brought before the Senate by Senator W. J. Stone. Our live-
rs will appreciate any effort you may make in their behalf.
y truly, yours,

H. O. ALLISON, *Secretary.*

e to read the resolutions adopted by that association Janu-
16:

he live-stock industry of the corn belt is fundamental to the welfare
eople of the corn belt and to the consumers of meats in the United

his great industry is suffering from depression because of unsatis-
narket conditions; Be it
, That we favor early action by Congress conferring upon the Bureau
s and Country Organizations of the Department of Agriculture the
forcing a uniform system of accounting upon all corporations doing
ite business in the manufacturing, buying, and selling of food prod-
a view to making more insistent a proper relation between demand,
l price;
favor an early enactment by Congress of a law providing for the
ation of agricultural products;
United States Department of Agriculture be respectfully asked to
ent public reports on the meat supply of the United States, as it now
case of the grain supply;
we favor the strictest enforcement of the antitrust laws.
ee on resolutions: Dr. A. W. Nelson, Bunceton; Judge Wm. H. Wal-
s City; Frank McRoberts, Malta Bend; J. H. Starr, Centralia; S. D.
olumbia.

rse, I understand that this department does not have any-
ticularly to do with the enforcement of the antitrust law,
e you find a situation as I have described it, where there is
oid offered for cattle, evidently there is a combination some-
there would be some other packing house with a representa-
to buy those cattle. Where you find conditions of that
the duty of this department to report those facts to the
ficials of the Department of Justice or take other appro-
ion in order that those things might be looked into?

ALL. I am not fully advised as to the legal limitations of
u on that particular point.

BEY. You would not have any right, possibly, except to
is matter to the Department of Justice?

LL. But it is my understanding that that information should
ole.

BEY. If you found that that condition existed, what would
th that information? Do you try to remedy that situation?

ALL. Most assuredly, sir. As we get into this far enough
ine on wise solutions of these problems, it is our purpose
the utilization of that information in whatever way may
t effective. I think you understand that having only taken
ork within 18 months we are far from convinced that we
id the wisest solution of many of the problems which we
ountered.

BEY. I agree with you on that, and I am in accord abso-
h the work this office or bureau of marketing is going to do.
that within a reasonable time this will be one of the most
t branches in the Agricultural Department.

21st of October last, in the Chicago market, no buyers
for hogs. No prices were offered, and the shippers stood

around there until late in the afternoon before anybody mak bid on the hogs. There was not a great glut of the market or a thing of that sort, but the prices of the hogs went off that day fr 75 cents to $1.25. Now, evidently there must have been some concerted action on the part of the packing houses or the people bid for the packing houses, or something of that sort. Has matter been called to your attention?

Mr. HALL. Yes, sir: matters of that kind have been called to attention, and I might say right here that at the conference I ferred to, held in Chicago on the 15th and 16th of November (w I think is the first attempt that has ever been made to bring toge all of the interests involved in this great industry, from the ducer clear through to the consumer), all of these matters were p thoroughly discussed, and we have an official record of that ference, consisting of some several hundred pages, which I think most valuable material of that kind ever brought together.

Mr. RUBEY. There is a condition existing out in the live-stock ket that ought to be remedied. Whether that can be brought through this Office of Markets or not I do not know, but it you said in the beginning of your statement, interstate bu and if it can not be done in that way, then it ought to be do some law passed by Congress, in order that there shall be co tion between the packing houses of this country in buying pr If that is not true, the producers are going to suffer.

Mr. HOWELL. Have you ever considered whether the F Trade Commission should not take jurisdiction of a question kind?

Mr. RUBEY. Yes, sir; and there was a resolution introduced i gress a few days ago calling the attention of the Federal Trad mission to this matter and asking them to make an investiga

Mr. STEELE. Say, for instance, there are three or four p houses in one of these markets. Have you discovered that t a uniformity in the prices paid by those packing houses?

Mr. HALL. I can not say that we have investigated that.

Mr. STEELE. That is, have you gone far enough to find tha is a practical division of the cattle and the hogs by these par packing houses? In other words, have you found out that, if there arrives at that market 99 cars of fat cattle and hogs would be about an equal division of the cars to the packing h

Mr. HALL. We have a number of second-hand statements o points, but we have no first-hand information which I am i tion to give.

Mr. BRAND. I would like to inject an answer there to this that at the conference in Chicago an important commission Kansas City stated, and it was not denied in the conference, th had made a practice of splitting their shipments. We are n position to say that we have proof that that is the case.

Mr. STEELE. That may have been so in years gone by, bu not the case to-day. In other words, if 99 cars of butchers are at this particular market, would the beef cattle or slaughte which is to go to these beef markets be equally divided: and i were 150 cars of hogs to arrive there, would there be an division of the number of hogs to the packers?

Mr. HALL. Yes; that has been alleged.

STEELE. Then, have you arrived at a place where you can insist
of these buyers paying more for the product than they do?
r words, there is no law prohibiting whispering, is there?
, if it is understood among these packers that each one
his quota of the shipment and they know what prices they
sterday, they know about what to pay to-day. So is it your
or have you arrived at a conclusion that this stock is divided

IALL. No, sir; I can not say that I positively have. The best
ition we have on that subject is in the official record of our
ace at Chicago.
STEELE. Let me take Gov. Rubey's statement, where he said 75
as taken off the price of the hog at some particular day in
. Have you any law by which you could compel the pur-
o pay more than he did pay?
IALL. I do not think you could compel them to pay more, but
that, if collusion could be proven absolutely, it would be in
t of trade.
STEELE. Considering they are the only buyers on the market,
the men who handle all of this great commodity, and you
law to put a man in the penitentiary for whispering, and
not find any record, then how are you going to equalize these
the producer?
IALL. That is something that we have not solved as yet.
CHAIRMAN. And when you find a solution of that question I
u to give it to the cotton growers of South Carolina.
committee thereupon, at 5.45 p. m., took a recess until Friday,
y 11, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Friday, February 11, 1916.

ommittee met at 10 a. m., Hon. Asbury F. Lever (chairman)
g.
CHAIRMAN. Gentlemen, I want to say to the members of the
ee especially this morning that the problem of farm distribu-
farm finance ramifies in so many directions and involves so
oblems that this committee could probably with profit spend
six months in hearing these specialists along their particular
t it is absolutely necessary, if this appropriation bill is to be
ed in the House in the next two months, that there shall be a
ion some time shortly of these hearings. There is no intima-
ny part or any suggestion made of unduly limiting the mem-
the committee in seeking information, but I do feel that we
en such a wide latitude here, that we have spent—and the
n has been as guilty as any member of the committee—too
me in discussions across the table with each other, rather
ing the witnesses who come to tell us what they are doing an
aity to do so. I want to make a personal appeal to the mem-
the committee to make their questions as brief as possible,
them be so framed that they go to the meat of getting the
tion sought, so that we limit a way the time spent in
arings. It ill tal at k the hearings are
nd the test y t ommittee will be

able to report back to the full comm
another week before the full commi
bill. It will take the clerk of the
another week before the report or
after it is agreed upon. So that, a
we will be here until the 1st of A
floor of the House.

In the meantime, other committee
priation bills, and they will get t
from us, and this bill will be waitin
we can get it considered on the fl

Now, I want to ask in all earne
get the information they wish of t
before the committee in the quick
the witnesses to brief up, as much
is impossible for this committee to
you are trying to do. The best t
any Member of Congress can do.
picture of what you are trying to
are trying to do it.

Now, with that statement, gentl
morning as rapidly as possible. I
they are exceedingly interesting.
Dr. Thompson, I presume, who is
this country. I have some familia
brought to the attention of the
These charts may open up the wh
this committee can not possibly g
the time, in the first place, and,
jurisdiction of the subject. I unde
rency Committee is practically re
So that, except for an explanation
bers of the committee will confine t
tion in the briefest possible way an

Mr. STEELE. And that they will
subject of cotton.

The CHAIRMAN. I will say to the
other States who do not know cot
up the time of the committee inqu
concerned. I will not ask a questio
mation that I think we ought to ha
most of the questions about cotto
know the least about it.

Now, Mr. Brand, you may proce

Mr. BRAND. We will continue t
question of marketing of live stock

STATEMENT OF MR. LOUIS D. BRAND, OFFICE OF MARKETING OF LIVE STOCK AND MEAT PRODUCTS, OFFICE OF MARKETING AND REGULATION—Continued.

Mr. HALL. I want to say that th
reference to the central markets is
of our work, and I would like as br

our work and then go into the details on any phase that particular interest to any of you.

ing what I said as to the central markets yesterday, I marize by saying that the principal points that we have in our investigations so far upon which improvements ns at the central markets seem to be needed are, first, the more competition, which was discussed yesterday. I think wide difference of opinion as to the means of bringing this cond, more stable prices, and I suppose that the violent s of prices at the central markets are the most common mplaints that are coming to us from day to day, and for re are various remedies that will in part help solve the

ould be a better distribution of receipts of the different stock throughout the season instead of there being a con- different classes of cattle—range stock, for instance—dur- paratively short season. Of course, there is a limitation as iod over which they can be spread out. A good example an be done in that respect is the effort of the National vers' Association in bringing about early lambing through- rthwestern States, which means that the lambs begin com- e market in June instead of August and September, as nd spreads the marketing of lambs over five or six months only two or three months.

ie thing applies to the distribution of receipts over the e week. Most of the markets, as the chart which I have indicate to the eye, are in this situation: Monday and y in Chicago represent 77 per cent of the receipts of the that means a congestion in unloading and an impediment s on the part of everybody concerned. To what extent it to remedy that difficulty we are trying at present to deter- far as we have studied it we find it is largely a matter ie railroads and the shippers.

. White, who spoke to you yesterday, is working with the f our project in trying to bring about a condition which e the railroads and the shippers to adjust the schedules of rains so as to make it possible to get more cattle there on nd Thursday and relieve the congestion on Monday and y. Of course, we do not expect to bring about an equally l five-day market, but it looks possible to do a good deal line. At the conference in Chicago in November, at which tives of all branches of the industry were present, it was everyone that it will be a splendid improvement if it can t about, and it was felt that it is practicable in part to out.

ere is a need of more uniform reports from the different . We are engaged at present in an effort to get monthly a blank which we have supplied to some 35 or 38 markets, entioned yesterday, and we find that the stockyards people urteous in cooperating with us in this matter.

EY. Is that paper that you have a list of the questions that ut?

[illegible]

[illegible]

[illegible]

itory receipts drawn from:
ef cattle
gs
eep
rses and mules
lves
iry cattle
ats
eder cattle
ly movement of live stock, by months:
ttle (beef and dairy)
gs
eep
rses and mules
lves
ats
veekly, monthly, and yearly statements published?
eceipts and shipments, by months, as far back as possible (see attached sets)
al receipts, by months (see attached sheets):
ef cattle
gs
eep
rses
lves
iry cattle
ats
iles
eder cattle
al shipments, by months. (Show destination, if possible.) (See attached sheets):
ef cattle
gs
eep
rses
lves
iry cattle
ats
iles
eder cattle
kind of stock do you consider your specialty?
et demands:
ef cattle
gs
eep
rses
lves
iry cattle
ats
iles
eder cattle
et days for:
ef cattle
gs
eep
rses and mules
lves
iry cattle
ats
eder cattle
market opens
ses
e these hours prescribed by the live-stock exchanges, yards, or by whom?
n feeder stock be bought and sold before and after these hours?
hing charges

24. [illegible] similar to Geor
25. Average [illegible] per head not mor
Cattle
Hogs
Sheep
Horses and mules
Calves
26. [illegible] per head not
Cattle
Hogs
Sheep
Horses and mules
Calves
Dairy cattle
Mixe
Cattle
Hogs
Sheep
Horses and mules
Calves
Dairy cattle
27. Demurrage charge
28. Detention charge
Stags and piggy sows
29. Peddings for stags and piggy sows
30. Watering charges
31. Feeding charges
Number of sheep fed per hour
Number of cattle fed per hour
32. Shearing charges
33. Weighing charges
34. Are freight charges based on actual
When freight charges are based
per car are used for:
Cattle
Hogs
Sheep
Horses and mules
Calves
35. Railroad scales (answer where freig
weights):
Ownership
Distance from yards
Description of equipment
36. Stockyards scales:
Number
When and how tested
37. Feed charges:
Corn
Oats
Wheat
Barley
Hay—
Native
Timothy
Prairie
Clover
Alfalfa
Mixed

l charges—Continued.
lding—
Straw
Sand
Sawdust
Shavings
ling en route:
rges (itemize); are there yardage, switching, and insurance charges
ade against stock stopped en route for feed?

(Origin of shipments.)		(Destination of shipments.)

ie points at which shipments coming to your market from other markets
e stopped and fed.

(From.)		(Points.)

py cattle:
'umber received annually
rices paid
ontract for sale made by whom
o whom sold
'sual amount received by shipper
ps":

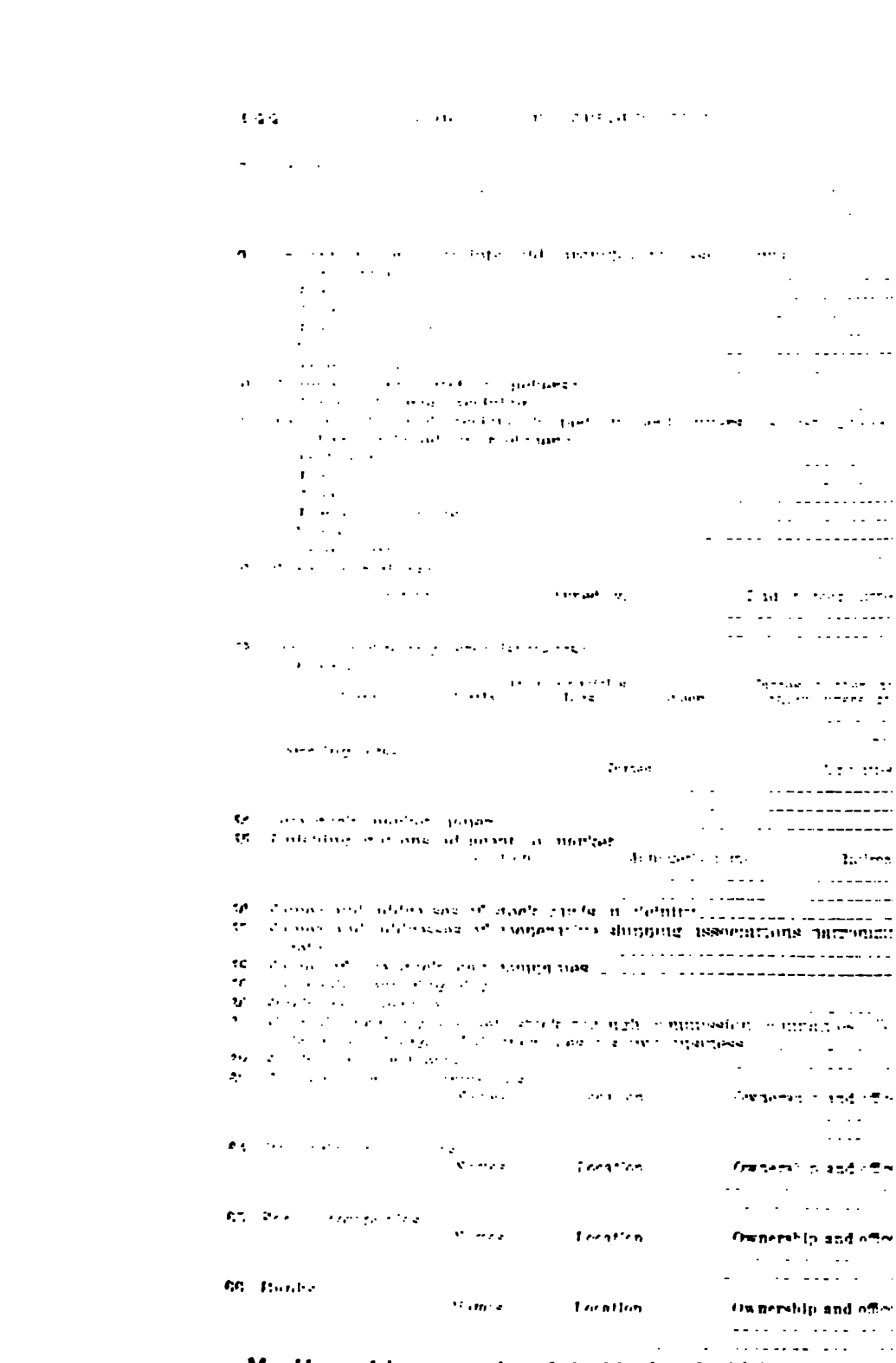
	Cattle.	Hogs.	Sheep.	Calves.
umber received annually				
rices paid				

ontract for sale made by whom
o whom sold
[stock:

	Cattle.	Hogs.	Sheep.	H. & M.	Calves.
umber received annually					
rices paid					

ontract for sale made by whom
o whom sold
nission firms:
umber
ames
Stock Exchange:
resident
ecretary
'embership fee
ules
ate of organization
ond required by stockyards company
[ust all stockholders of a firm be members
'ulators and traders:
'umber permanently located at market
'ames
lers' organization:
resident
ecretary
[embership fee
'ules
'ate of organization
ond required by stockyards company
[ust all stockholders of a firm be members
ler-cattle dealers:
'umber permanently located at market
'ames
nd inspectors:

Names.		States or associations represented.



Mr. HALL. I have samples of the blanks of which I spoke jus
and which we are sending out, which I shall be glad to show

r with the blanks on which we are entering up this information
onth to month. In the course of time we will get it perfected
d it out as a monthly news service along the same line that
ntioned yesterday for perishable crops. We think that the
n need a good deal of information which is now available
people at the markets and that, if that can be done, it will
bout a more intelligent and evenly distributed marketing of
some extent at least.

STEELE. Your project covers the live-stock industry, does it

HALL. Our project is entitled "The marketing of live stock,
nd animal by-products."

STEELE. I will have to ask the chairman that your discussion
in line with that work.

HALL. I might say that we are cooperating with the Bureau
Estimates in that matter, which is more or less statistical,
ught to be taken up from the standpoint of the stockmen and
ho are familiar with the live-stock business.

CHAIRMAN. You say that on certain days of the week your
o far show that the stockyards are glutted and overcrowded?

HALL. Yes, sir.

CHAIRMAN. Due to—I do not know what, and I do not know
know what.

HALL. It is due to a variety of causes.

CHAIRMAN. Yes; to a variety of causes.

HALL. And that is what we want to study.

CHAIRMAN. Now, what you are driving at is to try to draw a
conclusion as to the cause and then try to work a remedy
situation?

HALL. Yes; but what I was saying a moment ago deals with
subject.

TEELE. At the proper time I want to ask if the live-stock ex-
and commission men have not been working on that problem
r 35 years?

HALL. Yes, sir.

TEELE. And they can not change it?

HALL. You are speaking of the five-day market proposition?

TEELE. Yes; Monday and Wednesday. The glut is on Mon-
Wednesday, is it not?

HALL. Yes. There have been several very carefully laid at-
nade to improve the conditions, but they have failed.

STEELE. Now, the condition is this, as I understand it: The
buyers go to the western markets to buy their fat cattle.
nt to buy them on Monday and Wednesday. They do not want
hem on Thursday; consequently the farmer knows that he is
competition unless he is on the Monday market or on the
day market: and the fact seems to be that it is to their interest
se eastern buyers should go to these particular markets on
rticular days.

HALL. At our conference in Chicago the eastern buyers told us
y could buy just as well on other days of the week but that
ent custom is a relic of the old days when the export boats
ertain week days and when the New York trade was consum-

[illegible] large number of the cattle. It seems that [illegible]
[illegible] days a week [illegible] the cattle on other days if they [illegible]

The CHAIRMAN. It is a trade custom?

Mr. HOLT. It is a trade custom which [illegible]
[illegible]

[illegible]

[illegible]

TEELE. Nineteen thousand pounds is a short car; 26,000 is

ALL. Nothing regular, but 22,000 is the usual weight.
'EELE. Twenty-two thousand five hundred pounds?
ALL. That varies in the several classifications.
'EELE. But my understanding is that certain lengths of cars
rtain minimum?
ALL. No, sir; that varies in different sections of the country.
a great need of uniformity along that line. Take the case of
When we were investigating the marketing of live stock in Col-
d Wyoming we found that the minimum was 22,000 pounds, I
a double-deck car of lambs. It varies from 10,000 to 16,000
-deck cars and from 19,000 to 26,000 on double-deck cars,
with the length of the car, etc. But it is the uniform testi-
sheepmen in the West that they can not possibly load a
f lambs up to a minimum weight because those minimum
re on the basis of sheep and not on the basis of lambs. Con-
, on every carload of lambs that comes in there are several
freight, over the actual weight hauled, to pay. In the
a large extent, the rates are based on an amount per car.
ourages overloading and increases the amount of damage
in transit. It would take a long time and it will take the
on of many of those interests to bring about much improve-
that point; but that is all the more reason why some begin-
ld be made with it, and on that point, so far, we have only
ginning.
EELE. Now, as to distributing these fat cattle that you speak
the market at later periods, I would like you to tell me
are going to do that?
ALL. We think that will be a very slow process but that by
placing ourselves in a position to publish monthly or possi-
monthly or quarterly reports—we do not know just yet
it may be practicable to publish those——
EELE (interposing). Now, you understand that I am talking
rly about Iowa, Missouri, Nebraska, and South Dakota—the
districts where they raise corn. They do not raise cattle
heir farms are not large enough. They have got to raise a
and then go into the cattle-raising districts and buy their
l put them in, and they put them in along about the 1st of
r the 1st of November. Now, the profitable feeding life of a
om four to five months.
ALL. Yes.
EELE. Now, if that entire territory has consumed all of the
tle—the feeding types to put into the yards—they must
e cattle in in February and March.
ALL. Yes.
EELE. Now, how is it possible for you to tell me as a farmer
nsuming my feed (and my gains are only about 2 pounds
ebruary) that I can go and buy 50-cent or 60-cent corn and
rofitable for me to continue that feed for 30, 60, or 90 days
How do you figure but that I am losing money? Con-
, not having the money and not having the desire to go to
and borrow more money to feed my cattle or buy this corn

that is necessary for me to protect whatever little profit I already have. I must ship my cattle in January and February, when these fat-cattle floods come, and it is impossible to change them. We farmers have been trying to get away from that by the summer feed, but the great bulk of these western cattle are fed four or five months, four months being the average, from October and November, and shipped February and March, which is the fat-cattle flood tide on the markets. For instance, you buy a load of cattle at $6 a hundred on the market and you ship them to your farm. It takes 10 or 15 cents freight and then you put 50-cent corn in them. Really to make any profit you ought to sell for 8 cents a pound, but, if you only get 7 cents at the market and your steer weighs a thousand pounds, you have $10 profit to start with, which is not enough for the farmer to make a living profit. Now, under those circumstances when you have to ship the cattle, I do not see how this Government or the Kaiser of Germany could change the flood of cattle at this particular season.

The CHAIRMAN. Ever since I was born, and long before that—before my daddy or his daddy were born—the people of the South have been in the very same condition with reference to cotton that you describe as existing in the cattle business. We have sold the bulk of our cotton crop from the 15th of September to the 15th of January. We have been doing that ever since the first seed was planted in the South, with the result that many of us have "busted" and gone poverty stricken in that country, and never was the last three or four years did the producers wake up to the fact that that system could be changed if they could get cheap money. Therefore, many of the States in the South are adopting State warehouse systems whereby they can use these warehouses and borrow cheap money to prevent the situation you describe. Now, if we can do that we can lengthen the period very much for handling our cotton. It may be that in a thorough investigation of the subject somebody will discover a method of working out that problem.

Mr. STEELE. But you can not take a load of cattle and put them in a hay barn and not feed them.

The CHAIRMAN. That is very true. I appreciate the difference, but I say, with respect to cotton, which is such a nonperishable thing that it was marketed for about 200 years before anybody discovered that it was nonperishable.

Mr. STEELE. But you can put it on the shelves, and it will not decrease.

Mr. HALL. May I say that the Corn Belt Meat Producers' Association, which is virtually an Iowa cattle feeders' association, is working with us on this proposition, and the president and executive committee of that association have expressed the belief that that could be done. They admit that it is a hard proposition, but as an old—I do not believe I could make you believe that I am an old feeder—but a former cattle feeder in Iowa——

Mr. STEELE (interposing). Yes; old cattle feeder.

Mr. HALL. I understand that it will be difficult to bring that condition about to a great extent, but what the lamb feeders have done in the Northwest is an illustration of what can be done. It occurs to me also that in the tobacco district in Lancaster County, Pa.,

y to seventy-five thousand cattle a year, and they are not so as the corn-belt feeders think they are as to the particular ıen they must get their cattle and the particular time when ve to sell them. There is room for some shifting of dates in ding system in Lancaster County, Pa., and perhaps in some istricts of the South in cottonseed-meal feeding areas.

ıer thing on that point is this: A great many cattle feeders ınow more about certain times in the year when certain grades r cattle should be bought, when they are best worth the money, time of the year when certain grades of fat cattle can be sold dvantage.

in going through Iowa and other States, and especially in where I was familiar with the situation for a number of ıat some men will buy the best grades of feeding cattle in er and October and feed them for the spring market, ap- not considering at all that they are marketing their cattle when those grades are least in demand; and others are feed- mon cattle for the fall market, forgetting that that is the ın grass beef comes on the market, to compete with grain-fed plain quality. By getting that information into such form ıan can not help seeing it, while we realize that it will be a e before it can be done, we know that a great deal can be shed through this periodical market reporting. If we could he feeders along this line it would overcome a great many difficulties.

ELGESEN. Have you worked out any definite plan to convert You speak about converting them. Have you any defi- to hold out to them to convert them to?

ALL. That part seems very simple. What we want is more listribution of receipts. We are going to cooperate, and we cooperating, with State associations such as the Iowa Association and the Corn Belt Meat Producers' Associa-

ELGESEN. If you spread out the marketing of cattle over the ıs of the year it would be an ideal system, but how are you accomplish that?

ALL. We do not expect to do that completely, sir, but by ing the feeding of more cattle on grass in districts where ossible and profitable—by going into such a district as Lan- ounty, Pa., and endeavoring in the first place to deter- what is practicable as to a change in the time of feeding, her districts, we believe that gradual progress can be made.

ELGESEN. How many large cattle markets are there?

ALL. We usually speak of 12 or 15 big markets—Chicago Missouri River markets and three or four more that are s principal markets. I said yesterday, when you were not sir, that there are about 35 or 36 central markets in this o which you can consign stock and sell it on commission.

ELGESEN. Do you not find a situation frequently where one ıay be flooded with cattle and the other markets be short?

ALL. That is frequently the case. It is not so frequent and e as in the case of perishable products like strawberries, but to a large extent.

Mr. HELGESEN. But the way in which it has been work the West on other lines is by not permitting goods to go to when the flood time comes and by distributing the goods market is short. I think that something like that may be be cattle.

Mr. HALL. We have thought that at some time it might able to have a Federal representative at the principal through whom this news might be gathered and centralized tribution.

Mr. STEELE. Do you not suppose that the cattlemen kno conditions just as well as a representative sent out by this ment as to just where he can sell his cattle?

Mr. HALL. Most of the experienced cattlemen do. Mr. St a great many of the younger men, the beginners in the cat ness, are demanding information along this line, and we are the information they want so that it can be prepared for There is a good deal that we can not give them fully at we feel that it is the duty of the Government to prepare to be as far as possible.

Mr. STEELE. For instance, Clay, Robinson & Co. are the loaners of money upon range cattle in the world. Do you the Government could send a man to any one of these man direct any portion of the shipment of those cattle?

Mr. HALL. Not at the present time. I do not think that possible now.

Mr. STEELE. Do you not suppose that they know and their desire to get the best price for their cattle that they can their customers and to send them to the proper market?

Mr. HALL. The situation on that point is just as was pre yesterday in connection with the distribution of fruit. Ea concerned is doing the very best he can, and some have de very high degree of efficiency. But there are many points they are not getting together as they should. There are which the stockman does not understand the commission the stockyard people and the packers——

Mr. STEELE (interposing). Oh, the stockmen understa commission men very well.

Mr. HALL. I appreciate that.

Mr. STEELE. They understand their commission men very the same as a client understands his legal adviser.

Mr. HALL. I am speaking of them as a body. There is vision for general cooperation. There is most excellent co in individual cases.

Mr. STEELE. There is absolute cooperation.

Mr. HALL. But I am speaking about the cooperation that sary to bring about a change in these general tendencies, w can see from the chart are wrong and which no one man or firm or association of men can change very much but wi necessity to correlate and bring together in a large way. time and slow progress in some particulars.

Mr. HELGESEN. I think Mr. Steele's trouble is that he ju majority by a few large intelligent shippers, whereas the great many small shippers who combine to make a large shipment and who know very little about it.

STEELE. That is true. They put these cattle on the cars, and ill be several colors of paint on them, and they will be

HELGESEN (interposing). Oh, but you are talking about mar- conditions, and they do not know anything about that at all.
CHAIRMAN. All right, Mr. Hall, proceed.
HALL. There are a number of matters that I might class under d of abuses which stockmen generally are complaining to us both individually and through their associations. The mar- committee of the American National Live Stock Association l last year that the most important problem confronting n at the present time is the stockyard problem, the conditions stockyards, and they enumerated a number of conditions to the interests of the stockmen which demand to be reme- hey have asked the cooperation of the Department of Agri- on some of those matters, and so far as it is consistent we t such an association as the American National Live Stock ion, the Corn Belt Meat Producers' Association, and other tative associations of live-stock men are entitled to such ion as we are in a position to give them.
tters of market service, discriminations, and unfair practices eprive the shipper of stock of a fair return on the animals he ped to the markets, we believe that we ought to get complete ion in order that the facts may be furnished to the shippers for their benefit.
TEELE. You speak about abuses. Name some of those abuses.
HALL. The discriminations against stock that is forwarded market to another is a good example of that. I might say onference with the buying interests they admitted that there abuse, and recently some of the interested parties have ex- heir intention to correct that matter just as far as they are tion to do so.
TEELE. There is a question I would like to have you solve. ance. Helgesen ships a load of cattle to Sioux City. He is fied with the price offered. He forwards them to Chicago money. Now, can you tell me why?
ALL. In some cases it has been declared, and it is in the official entioned here, that that is because the bid on those cattle at market has been wired to the second market, and that the been discriminated against on that ground, not only in one in hundreds of cases which have been reported to us but , I may say, we have not personal eye and ear knowledge. , it is on record unquestionably, and the records will bear out ment. There is no question but that there have been abuses; ng interests themselves have recently admitted that, and ressed a willingness to better conditions as far as they could.
EELE. What buying interests?
ALL. The buying interests at some of the principal stock- do not know whether it would be proper for me to name

TEELE. Well, say he ships his cattle to me and I offer his sale. He is not satisfied and says, "I am going to Chi- these cattle. I know they are worth more money." And Now, Helgesen, I believe you are making a mistake." He

[illegible]

Mr. Burry. Assuming that they pay the same in Chicago that they pay at Sioux City, should not

Mr. Sterry. Yes.

Mr. Burry. Because the commodities of the should sell at Sioux City?

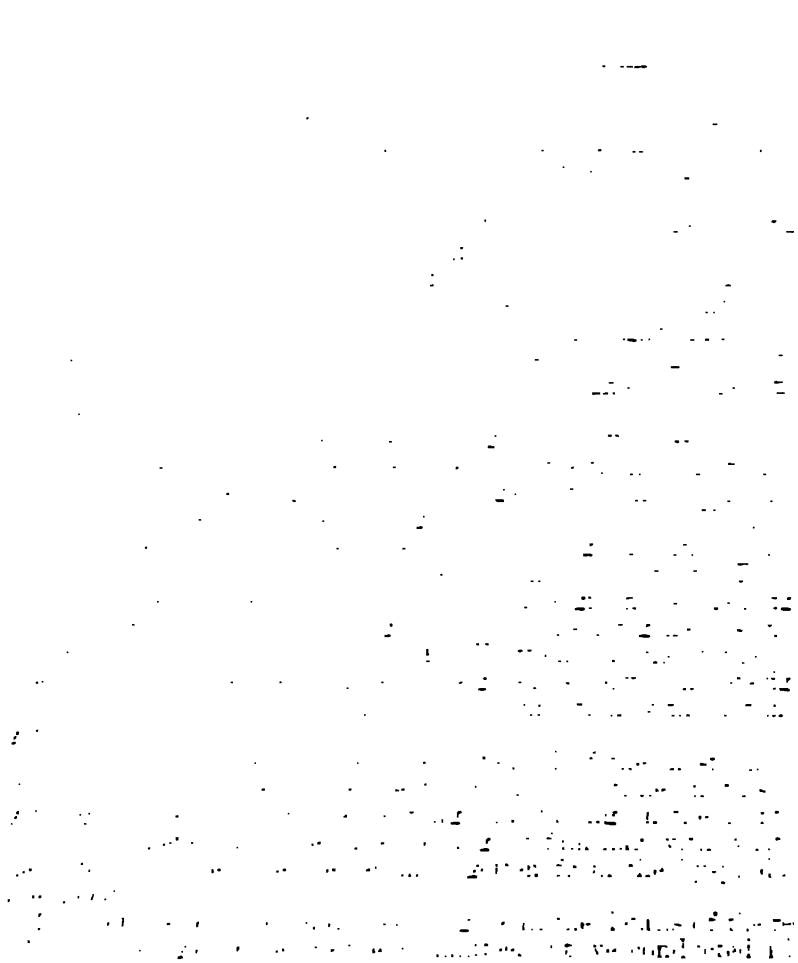
Mr. Sterry. Yes, but commission men must to go.

Mr. Hart. If the great live-stock markets open market in every sense, it ought not to where the cattle have been two or three days be sold at their value on the market to which that has been admitted by everyone concerned. is an abuse that will be remedied.

Mr. Burry. That whole trouble is because t trols the market in all these places.

Mr. Sterry. That is it.

HAUGEN. I understood you to say that the Secretary had
l out this plan and that you followed that plan.
HALL. I said that the work we did in tracing those shipments
e was carried on in connection with a special phase of work
ertain committee called the committee on the meat situation.
as only a part of our work, but I want to say that we are
r with the conditions in these stockyards, although we have
authority to go in and secure evidence on some of these
that have been mentioned.
HAUGEN. But you have the authority to investigate and to go
stockyards?
HALL. Yes; in that way.
HAUGEN. What is going on over there? What have you dis-
? What can you tell us about these combinations in the
rds? How is stock sold and bought? Is stock being divided?
s the practice?
HALL. As I said, in the matter of split buying, the most that
on that is the testimony that was given at our hearing in
in November, and we consider that very valuable. Now, we
en in the stockyards——
HAUGEN (interposing). You could not spend an evening in the
rds without learning some of these things, because no man can
there for half an hour without understanding something that
on. I would like to have you put in the record exactly what
overed and what information you can give the people. You
oken about certain organizations that are doing certain work
rtain lines, and we have appropriated certain money for the
of supplying people with information. Now, can you give
ement and have it put in the record that will be of some value
tain some information? You have talked about rounding
e in Montana and other States. That is very interesting, but
the cowboys can handle that situation.
HALL. Certainly.
HAUGEN. What we are interested in is the operation of the
rds.
CHAIRMAN. Let me make a suggestion: Let Mr. Brand de-
the committee, a little bit more fully than Mr. Hall has, just
ation of these things. My understanding is that some years
Secretary of Agriculture appointed a committee consisting
sentatives of a number of bureaus in the department to make
igh and systematic study of the meat-marketing industry
view of getting the facts, and Mr. Hall is really only a part
hain in that development. Now, suppose you put into the
Mr. Brand, just what facts you have in regard to this question.
BRAND. A committee on the economics of the meat situation
ointed, consisting of the Assistant Secretary at that time,
oway; Prof. Mumford, of Illinois, whose assistant Mr. Hall
10 years; Prof. Curtis, of Iowa; Dr. Carver, professor of
es at Harvard University and a foremost authority on agri-
economics in the country; and one or two other men, includ-
Waters, the president of the Kansas Agricultural College,
Melvin, chief of the Bureau of Animal Industry.
UBEY. When was that committee appointed?



ing [illegible] taken from Chicago, Kansas City, Sioux City, Den
[illegible] important centers, and we have a complete record of
proceedings of that meeting and of the problems that were discu
in each of the different departments of the industry, including
producers. The American National Live-Stock Association
represented by its president and secretary and its marketing c
mittee. We have a complete record of the proceedings covering
the various problems of the live stock industry, such as feeding p
lems and the ranging problems of the West and Middle West. I
not give the details as well as Mr. Hall can. I am familiar w
the general problem through my own study of the situation
conditions.

The CHAIRMAN. Has this committee appointed by the Secret
having gathered this information and having it in its hands, p
in such shape that it would be accessible?

BRAND. Mr. Chairman, on Monday last a meeting of the men ve done the actual work on that report was held, and they are ing that report now.

RUBEY. That report will be published?

BRAND. Yes, sir; and we have a complete record of the Chicago g. It contains most valuable information on the live-stock y, and we think it ought to be printed. Our printing funds and we are going to ask the chairman if we can have it as a document of the House in order that it may be available e to whom it would be useful. We have hundreds of requests ll over the country for that report. Every man who was per- present at that meeting, and that includes some of the big l men as well as the packing-house men who were represented nsel in some cases, are very much interested in it, and a great eople desire to have this report. In my judgment it would ke over 125 pages.

HAUGEN. This is the second day that an effort has been made ood deal of time has been spent trying to get some informa- to the operation of the stockyards. When we get to asking ns about the stockyards we get a long interesting speech, very ing, indeed, but what we are concerned about more than that peration of these stockyards. Now, Mr. Chairman, when we certain information we find that it belongs over in some other or some other division, and we have speeches that do not throw ht on it but only serve to fill up several hundred pages of

CHAIRMAN. There may be a difference of opinion when that comes out. You might not think it is information, but Mr. nay think it is information.

HAUGEN. I take it that when Mr. Steele or any other member committee asks a question he desires information upon that ar question, and for that reason I am trying to find out some- bout the operation of the stockyards. We started yesterday on on this same question.

BRAND. I suggest that we have Prof. Hall tell something of the ations that we have made of the dead-stock abuse and the ng-plant conditions.

STEELE. I do not want you to get away from the point that a s got a shipment here and a certain shrinkage. Now, I want ell me how you are going to avoid that shrinkage?

CHAIRMAN. Now, Mr. Haugen asks one question and you are another.

HAUGEN. No; that is exactly the same thing.

CHAIRMAN. Then, Mr. Steele, put your question now.

STEELE. As I understand it, he has made 12 shipments and he owed these cattle until they are sold. Now, when they are l the shipper has got his bill of sale and taken out his freight, , his yardage, his commissions, and he has the balance and e home, he finds that he has had a certain shrinkage from veral shipments. I want to know what information in a you can give me that will be of benefit to me next year in g my shrinkage?

Mr. HALL. That is a big problem in itself, and we propose to n special investigations of shrinkage. One bulletin has been publi by the department on the subject of shrinkage in transit.

Mr. STEELE. Oh, you can publish bulletins, but how am I goin get away from shrinkage? For 35 years my cattle have aver from 60 to 90 pounds shrinkage shipped from the range to market, and I have never been able to reduce the shrinkage.

Mr. HALL. Many of the best stockmen have reduced their shr age to a minimum, but what we want is to put that information fore stockmen generally.

Mr. STEELE. After knowing these facts, what information can give me that will be of use to me next year?

Mr. HALL. In the case of an experienced man like Mr. St probably it would be impossible to give him any information t would reduce his shrinkage materially, but if he could load——

Mr. STEELE (interposing). Oh, he knows he has got to load 22 pounds.

Mr. HALL. But when we see a carload of hogs coming into Chic with anywhere from 1 to 20 dead hogs——

Mr. STEELE (interposing). Well, let us get away from the l situation.

Mr. HALL. The same thing applies to the marketing of cattle

Mr. STEELE. What about these cattle?

Mr. HAUGEN. Well, shrinkage first.

Mr. STEELE. The shrinkage is gone.

Mr. HALL. Of course, the shrinkage depends upon the amount fill that the cattle take on in the stockyards.

Mr. STEELE. But how are you going to change that?

Mr. HALL. I do not know that that has been reduced to a science.

Mr. OVERMYER. Perhaps the length of shipment would have som thing to do with it?

Mr. STEELE. Unquestionably.

Mr. HALL. My observation is that a good many stockmen do n pay much attention to the methods of feeding their cattle befo they are loaded. If they would feed them properly—if they wo water them, and then give them a feed of oats before they put th on the cars, they would have a whole lot less shrinkage than wh they feed them first and water on top of that.

Mr. STEELE. A good many shippers ship to Sioux City and get enormous fill, and the next time they come they take off enough that the shipper does not get any advantage of his fill.

Mr. HALL. That is another illustration——

Mr. STEELE (interposing). They took the oats out.

Mr. HALL. That is another feature of the shrinkage question. I do not believe in encouraging abnormal fills.

Mr. STEELE. Now, you trace these 12 cattle shipments out, a what is the situation?

Mr. BRAND. Mr. Steele, we have a voluminous record about t fill. I do not know what the practice would be, but I think it wo be proper for me to loan that record to you.

Mr. STEELE. If the information that you are going to give me the first shipment is of no benefit, if any information that you c give does not benefit this fellow or that fellow in regards to shrin

think you are spending this money for which you are asking
rease of $351,000 without any benefit.

BRAND. Mr. Steele, it is agreed by all of the people in the
ry, and they agree to it very seriously, that the Department of
lture is in a position to render an unusual service to these
nen because their conflict of interests makes it impossible for
o get together on many points which they individually agree
ught to get together on. They agree that a neutral body
s the Department of Agriculture is can serve them to great
age in handling these problems, which involve giving away
s secrets to each other and which they are perfectly willing
t to the Department of Agriculture. They are fully agreed
ese lines of work can produce very great benefits to them, and
e fully agreed that the men who are working on this matter
ctical live-stock men.

STEELE. I will admit that there are certain benefits that you
e, but this is what I want to find out: You can not benefit
ge cattleman by telling him how to ship his cattle, because
vs how, and he has got a certain shrinkage——

BRAND (interposing). The two largest live-stock shippers in
ited States think that we can help them. We must give some
e to what they think, because they have gone over all of our
nd assisted us in drawing them. I think the point is that you
realize that this is new work that we are just developing. It
infancy, and many of the points that you have in mind can
worked out as many other agricultural problems have been
out—by years of patient investigation and scientific study.
not cure pear blight without 20 years of patient investiga-
d so with other agricultural problems. We have economic
that are just as real as plant diseases and animal diseases,
s going to take time to work out these matters. I think a
irt of Mr. Steele's questioning is due to the fact that he has
ized that this is a very new work and that we are only be-
to secure information that will lead to the improvement of
ns which are the subject of investigation by this branch
epartment.

CHAIRMAN. I tried to bring out that fact yesterday—that this
nd-new departure in governmental work, that this office
hree years old, and that it started with small appropriations.
committee had taken the advice of certain farm organiza-
this country, we would have appropriated something like
)00 in one bill to provide an agricultural system which this
ee had worked out, without any information at all, and placed
the country as you would place a lid upon a bucket. But this
ee, in its wisdom, thought no system of agriculture could be
out except upon careful ascertaining of fundamental facts,
t the first duty and the first big purpose was to ascertain the
Now, these gentlemen have been trying to ascertain the facts
t two years, I think, and undoubtedly what Mr. Brand says in
e to some of Mr. Steele's questions is true—that the facts have
)een gathered. It is a question of getting the facts now, and
acts have not been had. When the facts have all been had,
e that some committee—I do not know whether I will be the

chairman of it or even whether I
matter of marketing and distribution
Mr. HALL. I would like to answ
shrinkage by saying that there is
that subject that has been obtained
over the country. That is on record
If you are feeding clover hay to the
hay away for a day or two before s
wheat straw, or some feed like th
patent antishrink medicines, which
the buyer is going to discount cattle
answer to Mr. Haugen. I would li
good deal more than cooperate wit
Much of this information that I a
the points that we have determin
shipments that we have traced thro
that we have made ourselves in the
our consultation with the most prac
we propose to continue this first-h
it seems most needed.

Mr. HAUGEN. I wish to congratu
to the subject. We have had two
intervening. Now, if we may get
want to know something about that
matter of fill some consideration an

Mr. HALL. I said a lot of inform
experiment stations all over the cou

Mr. HAUGEN. Now, what about
feeds oats, dry hay, salt, and a lot o
becomes of that?

Mr. HALL. I will say that we hav
weights in the stockyards.

Mr. HAUGEN. Cattle are fed on dr
will take a lot of water after they
The commission man does his part: t
are sold. The cattle now have a goo
selling price?

Mr. HALL. The greater the fill the

Mr. HAUGEN. Can you state that a

Mr. HALL. As a general rule, that

Mr. HAUGEN. Now, what next? W
or the shipper next? If you follow
becomes of them?

Mr. HALL. What becomes of the c

Mr. HAUGEN. Of what value is t
now?

Mr. HALL. That depends on how s
they are sold. It takes two hours
times, and in that case the fill is in
get to the scale.

Mr. HAUGEN. You have kept trac
scale?

Mr. HALL. It varies tremendously.

Mr. HAUGEN. What is the general

ALL. The cattle are generally started to the scale as soon are sold. It may take 20 minutes or a half hour, and in at present it is likely to take an hour.
AUGEN. How many get over the scale in 20 minutes?
ALL. Very few.
AUGEN. How many get over in an hour or two hours?
ALL. I can not give you the exact information, Mr. Haugen. aries a great deal.
AUGEN. You can not help but know what the practice is, If you have investigated it, you must have some informa- hat is the time from the pen to the scale?
ALL. In Chicago?
AUGEN. In Chicago, St. Louis, St. Paul, Kansas City, or r big city. We know that every hour or every minute rinkage. Have you investigated as to the time required pen to the scale and what the shrinkage is from the pen to ?
ALL. No, sir.
AUGEN. Don't you think that is very important?
ALL. In order to investigate the shrinkage of cattle from to the scale you would have to have a scale at the cattle

AUGEN. But you could make an estimate if you had the

ALL. We have some figures on the time. Here are a few nstances: Time occupied in driving cattle from sale pens at Union Stock Yards, Chicago, Monday, June 15, 1914, es; Monday, April 6, 1914, 40 minutes; Monday, April 6, ninutes.
articular investigation was made outside of the department. son, who is now with us, followed a number of shipments the Chicago stockyards with the time element particularly That information was obtained before he joined our staff. nly official information of that kind I know of that has ever ined by a disinterested party. I should estimate, Mr. Hau- under normal conditions in the Chicago stockyards, consid- is an average distance from the scale, that it takes from 30 o three-quarters of an hour, or possibly more, on an average, e cattle from the pen to the scale. On Thursday or Friday take a good deal less than that. I have seen Mondays when take three or four times that long—sometimes all the after-

AUGEN. I am speaking of the general practice.
ALL. I should say the average would be half an hour to rters of an hour.
AUGEN. I have knowledge of it having taken three or four

ALL. So have I.
AUGEN. Then, why put up an average of three-quarters of an

ALL. That is about the average. We think that $8 for Tuesday is a great deal better than $8 on Monday, because to the scale much quicker.

Mr. HAUGEN. In your investigations did you find any selling agr ment between the commission men and the packers?

Mr. HALL. No, sir. We have not attempted to discover anything that kind.

Mr. BRAND. We do not work with detectives, Mr. Haugen.

Mr. HAUGEN. That is investigation. It is not detective work.

Mr. BRAND. That would be in restraint of trade, and it would investigated by the Department of Justice and not by the Dep ment of Agriculture.

Mr. STEELE. I will state that there is no agreement, as far know, between the commission men and the packers as to the t they come to the scale, because the commission men are always e to get and preserve the fill. On account of the congestion, it is possible to weigh them over one or two scales in a reasonable t We have a good deal of complaint about that. We bring matter up to the president of the stockyards many, many times, they sometimes open up what we call the speculators' scales and hog scales, and they try to handle these cattle as rapidly as pos

Mr. HAUGEN. I would like to get a few minutes myself on fill proposition when you get through, Mr. Steele.

Mr. STEELE. Go ahead.

Mr. HAUGEN. You say there is no agreement between the mission men and the packers?

Mr. HALL. I said we had not learned of any.

Mr. HAUGEN. To some extent are not the commission men dep ent on the packers? I will put it in this way: Is it not an abs fact that the commission men are absolutely at the mercy of packers and that unless they do the bidding of the packers t they will not visit their yards to-morrow?

Mr. HALL. If you mean——

Mr. HAUGEN (interposing). That has been alleged. I am going to ask you to answer that question, but did you invest that? That is common knowledge. Did you look into that What conclusion did you reach?

Mr. HALL. As to the dependence of the commission men upo packers?

Mr. HAUGEN. Yes.

Mr. HALL. We know that the commission men are dependei the packers in various ways. In the first place, the commi man rents his office in a building which probably is owned b packers or by packing interests.

Mr. HAUGEN. Exactly.

Mr. HALL. And a great many commission men are dependent banks and loan companies, which are virtually representatives packing interests, for the funds with which they finance their ness, and, as was stated yesterday, competition has been reduc the years have gone by, thereby making the salesmen more depei on the reduced number of buyers; and to that extent it is very to us——

Mr. HAUGEN. But, to cut it short, you intend to include the tomers, too; that is, the packing houses and the scalpers?

Mr. HALL. Yes.

Mr. HAUGEN. Without the packing houses they would not be to do any business?

LL. No, sir; and the number of buying interests have been ecause the order buyers at markets throughout the country reduced to a small number of concerns.
UGEN. In your investigations did you find that stock is l directly to the buyer in the country or, in other words, al thing, that the stock is sold to the scalpers or feeders?
LL. The stock is sold to the scalpers, and it is a matter of plaint among the stockmen that they can not go to the n men and buy the stock out of their hands. That is the the principal market centers.
ELE. Now, I want to get in there.
UGEN. I prefer to finish this.
ELE. All right; go ahead.
AIRMAN. Let Mr. Haugen conclude his questioning, Mr.

UGEN. We agree that that is the general practice—that the r feeders are sold to the scalpers.
LL. May I read a statement into the record in answer to ion?
UGEN. Yes, indeed.
LL. At the hearing in November——
UGEN. All I care to get is something on this point.
LL. The secretary of the American National Live Stock n offered this as one recommendation among a few others tterment of the business from the standpoint of the stock- t the commission house shall not serve as both the seller of the same stock and that they shall sell direct to country s.
UGEN. To what extent does that practice continue—I mean irm buying and selling? For instance, one commission firm order from John Jones, and they sell it to another firm, mith, in Kansas, and charge two commissions.
LL. We are reliably informed that that is a very extensive but just to what extent it is conducted it is impossible to

UGEN. But in order to protect himself a commission man sell to such men as Mr. Lawler, the scalper, if he is going sh a standing with Mr. Lawler, and he is practically the mer now in Kansas City.
LL. We have information of actual cases in which commis- have refused to sell to a country buyer at the same price would sell to a regularly established trader in the yards.
UGEN. You have investigated that and can state positively is being done?
LL. As I said, we have a statement from what we con- liable source. We have not verified it, but we are informed is a very common condition at the market centers.
UGEN. Then they are absolutely at the mercy of the scalpers, Lawler, at Kansas City, is practically the only scalper?
LL. At Chicago there is a traders' live-stock exchange with rship of something like 550, a number of whom, though not e prominent.
UGEN. Well, how many? I want to know.
LL. They are all more or less prominent.

Mr. HAUGEN. Then are we to dra
[illegible] are absolutely at the
[illegible] the packing houses
[illegible] the packers are few, a
[illegible] their bidding to-day they will h
has been alleged that there is a secr
[illegible] and the packers and t
will not do the bidding of the packer
[illegible] the next day. Have you looked
Mr. HALL. No, sir; only in a very g
Mr. HAUGEN. Mr. Steele spoke of t
[illegible] going on in the stockyards.
Mr. HALL. I can not answer that.
Mr. HAUGEN. Well, you spoke of r
were you riding?
Mr. BRAND. Maybe it was Rosenba
depending on whose courtesy we were
matter whom we asked they would l
courtesy.
Mr. HAUGEN. And everybody kne
riding their horses, and there could
No wonder riding with these cattlemen w
whisperings!
Mr. HALL. Let me give you an inst
ment was made recently by a large e
cattle in the stockyards on a certain
bid on them. Another buyer was as
was too busy. He said, "I will ta
[illegible]—referring to the other b
The shipper cited that as an illustrati
in that connection. That was perf
shipper considered it a decided abuse.
Mr. HAUGEN. Now, we will take up
packing house has a head man who i
and he gives his instructions to the ma
Mr. HALL. Yes, sir.
Mr. HAUGEN. And they are divided
Mr. HALL. Yes, sir.
Mr. HAUGEN. He gives his orders
man in Mr. Steele's district, and if th
the bidding of Mr. Armour, or whos
man has that information and is su
to go near those pens the next day.
to any extent?
Mr. HALL. No, sir. Commission me
Mr. HAUGEN (interposing). Well,
and I would like to get something fro
Mr. HALL. Concerning matters of t
knowledge of discriminations of that
Mr. HAUGEN. You have no know
been alleged by any one?
Mr. HALL. Oh, yes; it has been alle
ord of our hearing at Chicago. That
hearing—to get it down in black and

AUGEN. What was the purpose of the hearings?
ALL. For the purpose of considering the marketing of live rticularly at the central markets.
UBEY. Mr. Chairman, I make the point that that is already :ord.
HAIRMAN. That is already in the record of this morning.
ALL. An opportunity was given to anyone who might com- any matters——
AUGEN (interposing). If it is in the record, let it go. I andid about it, Mr. Chairman. My purpose in asking for rmation is to know what this money is being expended for?
ALL. That is very proper.
AUGEN. If the department is going hand in hand with these and these people who are connected with them, then the misappropriated. If it is being spent for the benefit of the nd the farmer, then very well.
UBEY. I do not know whether or not you were here at the Mr. Brand made a complete statement this morning about ses of this meeting at Chicago.
AUGEN. I did not hear it all; I heard the last part of it me in.
HAIRMAN. Let me repeat that Mr. Brand explained very purposes of this hearing in Chicago and informed the e that they had a stenographic transcript of the evidence ce and that they were now going through that evidence with of reaching conclusions from it, and that they were going it if they had enough money to do so, or they would prob- this committee for money to publish the testimony. That satisfactorily explained to me, at least, but I do not know other members of the committee understand it. Do I state ly, gentlemen? I want to make my appeal to the committee. ne fact, Mr. Overmeyer?
ERMYER. I think so.
AUGEN. Does the hearing bear upon this question, the stock-

AND. Decidedly; in every particular.
EELE. I want to know this: The impression gained from the s of this witness under Mr. Haugen's questioning was that s a collusion between the commission men and the traders. call them scalpers, but I call them traders; they are mer- I want to say that there is no such collusion, and a commis- will sell to a farmer just as readily as he will sell to a at there are very few instances in which a farmer will take load of the commission man. He will want to select a cer- ber of steers. Now, the trade is in this condition: That if sell to the farmer 15 or 18 of the 21 or 22 steers, you would 4 or 5 steers upon your hands. Then it would be impossible o sell those cattle, because the trader would say, "You sold Jones. Let Jones take these cattle." Another fact is this, n the market opens at 8 o'clock in the morning you must idly, because your yards are full of cattle and you are ex- additional trains that will arrive with more cattle. Your re there to buy everything—your heifers, your light cattle, heavy cattle—and the farmer is reluctant to trade, because

[redacted]

Mr. HARRIS. I am not responsible f

The CHAIRMAN. Both of you have y
and the committee will look at them
there; but we have got to get on with t
has been on the stand for practically
to get through. Now, what is your nex

Mr. HART. I would like to name the
are engaged in and then will go into s
able. We are making a study of the
country. Here [indicating] is a map sh
packing points throughout the United
small points.

NDERSON. How many of them are cooperatively owned by alities?
IALL. These are not cooperative. I have a statement as to ive ones here. There is only one cooperative packing plant tion now, and that is at La Crosse, Wis., excepting one that ntly begun operation at Wausau, Wis.
OUNG. How are they succeeding?
IALL. They are making a very slow beginning, I must say. y one that has been in operation long enough to be a criterion nly in June, 1914, and, according to the newspaper reports rmation that has been given to our representative on a per- sit there, they have had very serious losses, due to misman- and misfortune of one kind or another, and they are just o get on their feet again now.
ant to determine the efficiency of the small packing plants d with the large ones and to find out how large a plant should ler to succeed, especially with reference to hogs. The han- cattle seems to be less susceptible to the operation of a small in the handling of hogs. We have made a study of the capi- ted in a number of these smaller plants. We find that that is ndertaking, and, as there are a great many of these plants, ke more time to bring it to a head.
IAUGEN. Have you any knowledge of a single plant suc-

ALL. Yes.
AUGEN. You are speaking of cooperative plants?
ALL. No, sir; I am speaking of privately owned plants.
AUGEN. You were speaking about cooperative plants a while

ALL. That question was asked while I was speaking about kind of plants.
AUGEN. How many cooperative plants are there?
ALL. There are 15 cities, principally in Wisconsin, Minne- l Iowa, in which the organization of cooperative plants has dertaken. In nearly every case it has been a promotion arried on by outside parties who have come into the com- o undertake to sell capital stock. Most of these attempts n abandoned, I believe, but there are still several under way. one in operation at La Crosse, Wis. We made an investiga- his whole situation and found that it was largely a promo- me. We issued a press bulletin last July, entitled Farmers' Houses, dealing with important factors which must not be led in connection with cooperative packing houses.
AUGEN. But there are others who invested their money in th—subscribed their money in good faith?
REELE. I will say, Mr. Chairman, if it is possible for this nt to encourage small packing plants all over the country ese cattle and hogs will not assemble at these large packing s, in my opinion, that is the only method in which the Gov- and the people can derive any benefit. You have taken away es from the great packing houses now, and it is possible for packing plant to ship its product to the markets as cheaply g packer. It is possible for the small plant to carry on its

HAIRMAN. Suppose you put that information in the record.
ALL. Yes, sir.
statement referred to follows:)

refrigerator cars owned and controlled by the large packing interests, nuary, 1913, as ascertained by the Interstate Commerce Commission nvestigations covered by its Docket No. 4906.

Owned by—	Number of cars.
.....	14,447
.....	6,767
.....	1,576
.....	2,111
.....	24,901

ELGESEN. If that is true, do you think that a privately owned perative plant on a small scale could operate successfully ave to go to the Big Four for refrigerator cars?
ALL. We think that their greatest opportunity for success eveloping the local trade and not in reaching out into the narkets any more than necessary. Of course, it will be for them to sell some of their surplus products at the arkets.
ELGESEN. Now, this is very important, because, according to nion, it would not be wise to establish a small packing plant ld go beyond the limits of local trade.
ALL. Not as a general proposition. I should say it would traordinary case where it would succeed on anything else cal-supply basis.
OWELL. Do you know what minimum capacity would be to insure the success of a small packing plant in the hog

ALL. No, sir; I could not give you a sufficiently definite n that.
OWELL. You have made some investigation of that subject?
ALL. Our Mr. Doty has studied that subject, and whether it 300 hogs or 500 hogs a week I would not want to say, but be glad to answer the committee more definitely later by it in the record.
AUGEN. Is the packing house permitted to own its own cars erator cars?
ALL. Yes.
AUGEN. Under the new law, ought not they to be owned by oads?
ALL. No, sir; not under any law that I know of.
er form of local marketing enterprise is the city-owned house, or the municipal abattoir, to give it a better sound- e. Various cities have found that they have got to take he situation in order to keep up satisfactory sanitary stand- , while the Bureau of Animal Industry is devoting attention nitary side of it, we are considering municipal abattoirs as mic project. There are seven municipally owned abattoirs nited States and there are about a dozen more that are owned.

it demand are "Meat on the farm" and "Meats: their com-
and cooking." These three are among the 10 most widely
l bulletins of the department. That illustrates the demand
mation as to the economic purchasing of meats. We believe
great decrease in the consumption of meat which the statis-
has taken place in the last few years could be to a consider-
nt offset by the right sort of a publication backed up by
al and extension work.
AUGEN. What can you suggest? Have you a single sugges-
ake?
ALL. Yes.
AUGEN. I understand your department has been carrying
of cooperative plant there?
ALL. I have no information as to that. I am not speaking
rative marketing; I am speaking of information that is
y the average family in buying their meat at the family
o that they will know which meats are worth the money
at they will know how to get the most for their money.
AUGEN. But another bureau has been teaching for a num-
ars the same thing. How are you going to decrease the
he consumer? You have investigated that for a number

ALL. But there has never been a properly illustrated publi-
that sort prepared.
AUGEN. You believe that you can improve upon the bulle-
have been issued heretofore?
ALL. We believe that we can issue a publication——
UGEN (interposing). I understand the object is to help the
as well as the producer. Now, how can you help the con-
d the producer?
LL. By giving him information.
UGEN. Information as to what—how to get things cheaper
to know what he is buying?
ALL. To be a better judge of what he buys at the market
ow how to get the full value of his money. Of course, as
that has been partially covered, but it has never been put
ystematic, illustrative way.
AUGEN. But you have nothing to suggest? You are not
y consideration to increasing the return to the producer
e lessening of the high cost of living that was promised us
rs ago?
LL. We think we can lessen the general cost by increasing
oving the demand for certain kinds of meat. Of course, the
meat depends on a good many factors, which have to be
consideration.
AUGEN. I understood you to say yesterday, with reference
sociations in Minnesota, that you were encouraging the
save money by shipping in such a way as to lessen expenses.
LL. Yes.
UGEN. And by doing away with the middleman's profit?
LL. Yes; with the local buyer's.
AUGEN. Now, there are people who believe that this whole
is for the purpose of doing away with the middleman—

RAND. I think I have covered that ground sufficiently.
AUGEN. Do you agree with the statement made by the doctor?
RAND. He has made a great many statements, with most of agree.
AUGEN. When I asked him what was the purpose, and if the purpose, he said yes.
RAND. I made it perfectly clear that wherever there is an ary middleman—and the middlemen agree to that themie will be eliminated, not by the department, but by the opf economic law.
AUGEN. You hold that it is an unnecessary evil for a man to k, assemble stock all over the country, ship it, and sell it at inal markets?
RAND. I hold that the farmers at Litchfield, Minn., who are ble to sell their live stock than any local buyer, ought to mselves; and the same thing happens in this case as in the itchfield, Mich., and likewise in Nebraska and in your State. e developing a large number of very efficient live-stock dis- organizations. Whenever they can perform that service iselves at a lower cost than it is performed by local men, I ey should do it.
HAIRMAN. Is that your policy, Mr. Brand?
RAND. Yes, sir.
HAIRMAN. That seems to answer it. Proceed, Mr. Hall.
ALL. Another purpose of this investigation is to give us a isis for quotations. At the present time we have no satisstatistics as to local meat prices, because nobody has defefined the retail grades; and most of the information that is given out by interested parties, either wholesale or retail ilers. We believe it is possible to work out some standards uld eventually be just as useful as the cotton standards, n standards, and other standards have been in their way. ve that a beginning should be made right away to develop ndards. In fact, a beginning has already been made in where the State experiment station has published bulletins lasses and grades of live stock and meat.
TEELE. Can you standardize live stock?
ALL. Not as cordwood, which can be measured in lengths. Illinois Experiment Station has been the means of bringing ore uniform and definite quotations on live stock in the daily k papers. I have copies of these publications, which I would ubmit for your information if you are interested in them.
TEELE. I can pick up a live-stock market report and find ttle selling from 7½ to 5 cents. How would you standardize rket?
ALL. It would be improved. I would not say standardized.
TEELE. What information would you give me that the 7½-cent as a certain standard that would have a certain quality?
ALL. It is largely a matter of quality in the case of cattle, nearest we can approach to that is to pick out a steer that is feeder or stocker and agree on that type, just as the cotton gree on a certain type of cotton as a standard.

HAIRMAN. Any further questions? We are much obliged to Hall. We will now take up the next project, Mr. Brand.
BRAND. The next project is entitled "Marketing business " I will ask Mr. Kerr to discuss that project.

ENT OF MR. W. H. KERR, IN CHARGE OF MARKETING ESS PRACTICE, OFFICE OF MARKETS AND RURAL ORATION.

ERR. Mr. Chairman, I will make my statement just as short le and to the point, and I shall be very glad to answer ques- t may help to bring out any details that any member of the e desires to inquire about.
HAIRMAN. I suggest that we let Mr. Kerr complete his state- d if gentlemen have questions to ask him let them note them et and wait until he completes his statement, so that we can irly good idea of the work he is trying to do. If any re sought to be brought out he can be questioned regarding that way. I will not adopt that rule unless it is agreeable mmittee. What do you say about it, gentlemen?
ERMYER. I am heartily in favor of it and have been all the

OWELL. I am in favor of it and always have been.
OUNG. So am I.
AUGEN. I suggest that, if any member desires to ask a ques- should first ask permission of the chairman, and that rule all time to come.
ERMYER. Of course, the chair would not want to refuse that request.
IDERSON. I find that sometimes these gentlemen do not make s entirely clear to me, and I would like to have the oppor- at least putting the question to make the proposition en- r if I do not understand any particular point.
AIRMAN. Let us understand ourselves, gentlemen: That we o let these gentlemen go on as rapidly as we can without cross-examine them into contradictions, and the like of that, get along as quickly as we can.
ERR. Thank you, sir. I will try to make the points as clear le. The line of work that we are engaged on is entitled ng business practice." That is, the business practice side of g, including a uniform system of accounting, financing, and s that affect the dollar-and-cent end of it, as they are kept ords. We have carried on extensive investigations through- United States, starting first with the farm elevators. We st, that the farm elevators, as a rule, were using systems of g which in no way showed the actual status of the business. them were unsystematic, and in many cases farmers were ney on stored grain. After a thorough investigation, as far ld make one, we devised a system of accounting which we nbodies the best elements of the systems with which we e in contact.
ed that system at 14 different elevators, in seven different d after a year's successful operation, and having brought it

before ... in the trade, we feel that that system ... system ... the country. On the 1st of May ... stock ... to date ... in use in 850 elevators in the ... States. ... a sample copy of the system, which is being ... by practically every one and that same system—the same ... size, the same card ... exactly the same method of operation—is being used in elevators as shown by these duck ... under that stage. We issue a booklet in which describes in detail the ... tion of that uniform system. Every item which enters ... of these ... tion on this map is handled in exactly the same ... At the close of the business year we send ... what is known as ... analysis sheet from each one of those 850 elevators. That ... analyzes the cost of doing business for the year ... that analysis sheet we work up a summary, and from that ... we work up a cost estimate of doing the work. In that ... are able to compare the operation of one elevator with ... show where improvements can be made, where the ... operating on an efficient basis, and where the margins ... high or too small, so from that we have a start ... show the exact status of the business at any moment. In ... Dakota and other States it is absolutely important that they ... know how much to account for to the farmer in stored grain.

We are now trying out a system for cooperative ... it has been so successful so far that we have decided to put it ... the form of a bulletin, thereby making it available to the ... both cooperative and independent, throughout the United ... We have a system which we are trying out experimentally in ... stock associations, and we are going to make that system avail... some 500 live stock shipping associations in this country if it is ... to be desirable. Then we have a system of cost accounting in co... tive canneries. Five canneries in the State of Oregon and one ... State of Washington (most of the cooperative canneries are lo... in the Pacific Northwest) are in operation under this system ... they are able to tell the exact cost of any particular product ... that way they can tell the price that they should pay to the f... and the amount of advance that they should make for different ... of delivery.

We found from a large number of requests received from the ... and commission men generally that there is a demand for a u... system of accounting for the commission business. This is a ... that we feel we should go into, but on account of other work we ... given it but slight attention. We have a system in Boston in a ... commission house there which has been in operation for ... months, and it has been our desire to extend that experimental ... tem to other cities in order that we may perfect a system ... records in identically the same way in commission houses ... the country, which will permit the furnishing of ... which will be intelligible and based upon records ... which will show the exact condition of facts relative ... end of the business. The trade is very anxious to ... for ... a partial agency ... stay ... [illegible]

... that there are a few small ... in the United States that keep no records. It is deplorable, ...

work and find the conditions existing in some of the small
on firms throughout the country. I have seen stuff come in
gnment and be entered up on a sheet of paper, and I have
or five lots of stuff of different grades and different quali-
to a man and entered as one sale, and I wondered how it was
for those firms to make a reliable return to the producer.
ld develop a better system of accounting along this line, all
ission firms throughout the country would be only too glad
it, and we would have a uniform basis on which all returns
figured, and, in case there is any difficulty or discrepancy
ver is not satisfied that his returns are based on the actual
it the market, he will be able, with but little difficulty, to
matter out through his accounting system. It not only pro-
commission man but the grower and the shipper as well.
nection with the elevator work, it may be said that that work
opular with the cooperative elevators that the indications
soon there will be many thousand elevators using that sys-
veral hundred of them intend to install it beginning with
iscal year, and we have concluded to include all the elevators
houses in the United States handling grain. To that end
w endeavoring to establish this uniform system of account-
he grain trade generally, and the indications are that it
lopted throughout the country. Seven State grain dealers'
ns have adopted that system, and it is being recommended
by printers and accountants for keeping the records of
companies. I have some 400 columns of newspaper and
er comments and a great many letters from managers and
o are using the system, showing that it meets the needs
g-felt want of these companies.
tter of auditing and financing, especially with cooperative
ions, is important, and we have spent considerable time in
on investigations with reference to the different methods of
these farm organizations. We have now in published
ilable for farmers who desire to make use of these things,
out into operation the financing of these organizations. It
mportant that the farmers' organizations in this country
financed on proper business principles, and we are work-
ne improvement of such cooperative marketing agencies as
and for the promotion of new ones.
fruit and produce work, we have devised a system of ac-
and that system is now in operation in some 37 fruit and
xchanges in the United States. A few of them are indi-
his chart by red dots [indicating].
he figures that we have received from managers who are
the system, we find that on an average, by operating this
hich we have developed for farm elevators, $100 a year can
in the item of labor cost in the keeping of those records.
on the basis of 450 elevators, not considering the great
vhich will in all probability adopt the system eventually,
ect a saving to the farmer on that item of $45,000 a year.
elevators which are using the system marketed this year
0 worth of products.
lume of business shows the necessity of keeping records in
e that a proper return can be made to the farmer. That is

Mr. [illegible] I understand you, [illegible] that [illegible] method which you [illegible] considerably reduced?

Mr. [illegible] We draw that conclusio[illegible] letters which we have received from [illegible] under the system who previously op[illegible] Now, that would not be true in ever[illegible] which we have received which lead us [illegible] is saved in the average elevator in the [illegible] improved methods of accounting.

Mr. [illegible] The Federal Trade [illegible] investigation with reference to the sta[illegible] ments. Have you cooperated with them?

Mr. [illegible] Very fully. The Federal [illegible] with Mr. Brand before they undertook [illegible] have a very definite understanding with [illegible]

Mr. [illegible] In all our work we work [illegible] Trade Commission.

The Chairman. Could you differentiate [illegible] sion and your work in this connection?

Mr. [illegible] The Federal Trade Com[illegible] ing to [illegible] products which [illegible]

Mr. [illegible] How about the stock?

Mr. [illegible] So far as I know, they [illegible] [illegible] connection with the C[illegible] [illegible] [illegible] was necessary [illegible] [illegible]

The Chairman. What would be the [illegible] the two lines of investigation? You wo[illegible]

RAND. Solely.
HAIRMAN. And farms?
RAND. Yes.
CHAIRMAN. And the Federal Trade Commission works

RAND (interposing). Manufactures and, to a large extent, ducers of semimanufactured farm products, and no doubt l soon get to the field where we are operating. However, not deal so much with the investigation of the practical side ing as we do. We investigate conditions of marketing and nents in methods of marketing products, while they investi- ditions to determine whether or not there is anything in of unfair competition, monopoly, or restraint of trade, agency and territory, boycotting, and things of that kind.
HAIRMAN. The purposes of the two investigations are en- ferent?
AND. Yes, sir; that is the general situation.
NDERSON. Mr. Kerr, the general propositions underlying all g systems are the same?
ERR. Yes.
NDERSON. Now, you spoke about the standardization of cost g in fruit canneries.
ERR. Yes, sir.
NDERSON. Does this standardization include canned corn, etc.?
ERR. So far we have confined ourselves to farm cooperative . The ones that we have investigated were primarily en- putting up small fruits and vegetables in the Northwest, system can be used by private enterprises as well as by

NDERSON. Of course, there are a good many more or less co- canneries engaged in canning tomatoes, corn, and peas, ; I wanted to get at was whether the accounting system u have worked out could be applied to all canneries?
ERR. Regardless of the product handled, it can be applied nning business now conducted, so far as we know—that is, w slight changes in the method of doing business.
AUGEN. Is that form the one used by the line elevators?
ERR. We have a very small line-elevator form that is used——
AUGEN (interposing). Did you work that out?
ERR. Yes; and after an extensive investigation we thought feature with which we came in contact, and one which we d be properly applicable to the situation, was similar in to the one we have adopted.
AUGEN. Do you suggest carbon copies?
ERR. Not for the original financial record. Carbon copies for all the scale tickets, warehouse receipts and checks, a, but for the regular financial records we use no carbon

AUGEN. How often are reports made?
ERR. During the height of the season they are made daily to of the central office.
AUGEN. Do you take carbon copies of managers' reports?
ERR. Yes; we do.

ERR. As efficient as possible.
AUGEN. You used the term burglar-proof.
ERR. I did not use that term myself; I was quoting somebody
is system of accounting will put the business in such shape
ll allow a disinterested agent at the end of the year to come
ake a comparison so that he will be able to point out places
ere may be an excessive cost, and things of that kind. It
great benefit to the producer.
ERMYER. How do you bring this system to the attention of
tors?
ERR. Every elevator in the United States received bulletin
n which we describe in detail the operation of this system,
opy of the form with sample entries, and with this form a
is able to take up the system with very little difficulty.
ERMYER. I was wondering whether the cooperative elevators
trict might know about this?
ERR. They all have that bulletin. In addition to that, we
n in a mailing tube printers' samples of each form. At
there are some seven large publishing houses printing the
id they have men out in the field selling these forms.
UGEN. As I understand you, this is to be a loose-leaf ledger?
RR. Yes, sir.
AUGEN. Do you make a carbon copy of the sheet "Grain
"? If you are a buyer, what report do you give to the
?
RR. If he desires it, we can give him the report daily, show-
mount of grain purchased by grades and by dollars and

UGEN. Do you give the names of the purchasers?
ER. He can have a copy if he wants it.
UGEN. He can, but what is your suggestion?
RR. Our suggestion is that the records will be kept in the
nd that a report should be made to the auditing com-
least once a month. That auditing committee goes over
ickets and other things and checks them up, and at the end
r a competent accountant comes in and goes over the whole

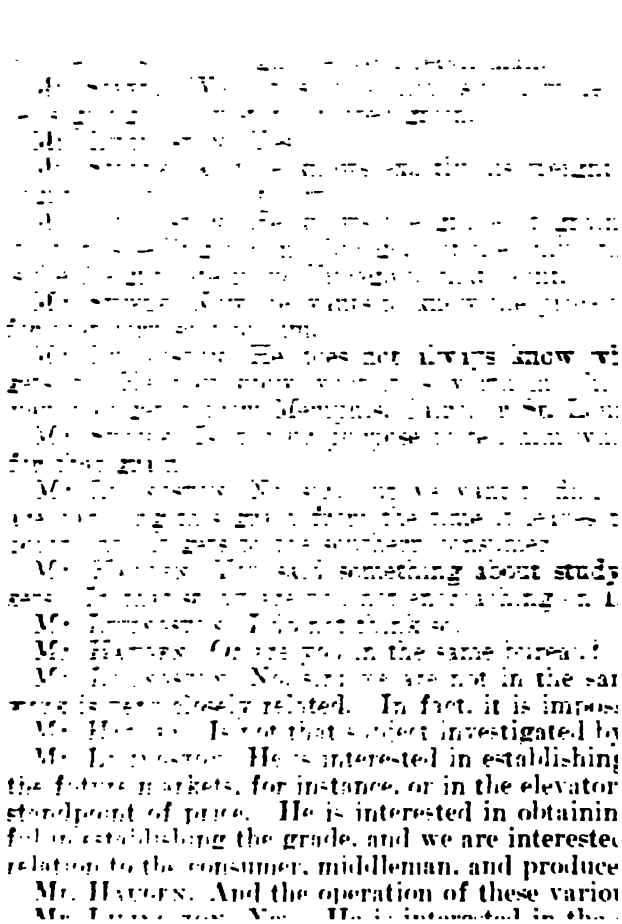
UGEN. That is not being done by the line elevators. I want
what is the practice of the people in the line elevators. Do
kly, or monthly reports made give the names of the parties
the goods are sold, by whom they are bought, and every-
etail; that is, as to farmers' elevators?
RR. Farmers' elevators are mostly only single elevators
business. If the president wants that information, we
d first that you get a good responsible manager and bond
hen go over his records with an auditing committee once a
o president wants to go over a stack of several thousand
pts every month or a few of them every night.
UGEN. I think most of them may do that, but some of
a rather loose system, and full reports are not made. My
ling is that the line elevators make carbon copies.
RR. They are operating under a different system. They
a central office where the financial records are kept, but in

ts have been made that he is working on a too narrow mar-
the business is depreciating and not self-supporting, and
a drag on the community. We want to obtain the facts in
y visiting a large number of elevators and observing exist-
itions. During the past summer we visited some 300 ele-
the Central West, and we hope to continue the study during
g year. There are some 25,000 or 30,000 elevators, but we
rviewed only a small percentage of them.
xt point is terminal marketing. The commercial exchanges
ls of trade, as well as country shippers and producers, are
o have a careful study made of the entire terminal market-
ion. There is an element of uncertain feeling in the public
lay, particularly among the producers, regarding the service
minal markets and their margin of profit; also with regard
ount of service actually rendered. We hope to make a de-
ly of each of the large terminal markets for the purpose of
ccurate reports on this subject. When completed, sugges-
rding possible improvements of certain marketing features
fered. If nothing is discovered, a frank statement of exist-
tions will be made public. Our purpose is to inquire into
nditions with a view to determining the economic possibili-
hether or not the terminal markets are being conducted in a
suring justice and fair dealing to producer and consumer.
some 25 or 30 large markets, and considerable time will be
o make a detailed study of each market. A study of a single
arket might be made, but, in my opinion, such a course
inadvisable, in that conditions existing in this particular
ght not obtain in others. Conditions vary in the different

t point we wish to consider is consuming marketing. The
has been submitted that the number of middlemen is
nd that there is too much difference in the prices between
ner's cost and the producer's selling price. Complaint has
that conditions in the South Atlantic States are such that
shipped in from the Middle West is handled by too many
n, producing a marked difference between the price of the
he East and West. We hope to go into that question and
ething about the details of consuming marketing. In that
also we wish to make inquiry into the advisability and
lity of establishing a consuming reporting system.
arious sections of the East and South Atlantic States and
suming territories the demand for grain and hay varies
to time and from year to year, depending upon the season
factors, the small shipper not always knowing just where
l a market for his surplus product. The large shipper is
in position to locate the best markets. We are looking into
ility of establishing a consuming reporting system to pro-
indication as to the amount of grain and hay needed in the
ctions of the country that are large consumers of those

point is hay marketing. The hay trade feels that it
eive as much consideration and attention in solving its
nd difficulties as has been given to the grain trade. The

developed to a point where it should not be permitted to through inability to market the grain.
s to the marketing in the Southern States, if the campaign sified farming which has been so generally inaugurated in is to meet with the success anticipated for it, the southern ust have some help in marketing his surplus grain. Con- ere are such that our office can be of material assistance. the large surplus brought up many problems, among them matter of elevator construction. In one State it was quite advocated that farmers should cooperate and construct ele- he office, through its representatives, discouraged the plan, tention to the fact that a great financial loss would result business at that particular time and advising the southern o utilize the cotton warehouses for grain-marketing pur- ier than to build new elevators. In point of fact, some erected and have not succeeded, while others are han- little business—hardly enough to justify the amount of ested.
sum up what I have attempted to say: We are just begin- tudy of grain, seed, and hay marketing conditions. We feel is a big field; that the value of the commodities is large; here is much misunderstanding regarding the service being by existing agencies. We are interested in finding out ose agencies are performing their functions in an economic nt way and what the prospect of future improvements are. lesire to do is to make an economic study of the entire situa- at we can report intelligently upon it. If present conditions at may be hoped for in the future, it is worth a whole farmer to know that. We want first to get the facts regard- ig conditions, whereupon we may be in position to suggest ovement. At any rate, we will be able to quote pertinent h will be of some service to producers as well as consumers.
LITTLE. What do you think about the ability to fix a per- andard for hay?
INGSTON. I think it should be done, but it will be a very sk, for, while it is the same as grain grading in one way, in s it is more complex. We are not able to put hay into the est and give it an accurate determination.
LITTLE. Do you think it can be done?
INGSTON. Yes; though not as definitely as we can find out, e, how much butter fat there is in milk; but we can greatly ne present condition.
ELE. You stated something about standardization of grain. ig grain from the North to the South and selling it to the nan, would not the purchaser be required to pay a greater he ought to? Somebody said that, if we passed this dardization bill (I think it was Mr. Rubey), in case shipped from the North to the South they would know e value of that grain upon the market, and consequently ld not be any excessive price charged to the consumers of e South. Is that true, Mr. Livingston?



UGEN. You said that there are too many middlemen. Now, understand that the slogan is "from the farm to the or something like that?
INGSTON. I did not make the statement that there were too dlemen. I said we want to find out how many middlemen

UGEN. What have you in view? If you find there are too l you eliminate them?
INGSTON. No. We will simply say so; that is all. We will the remark.
UGEN. Then, everybody will have to determine for himself is so?
INGSTON. Yes.
JGEN. Have you discovered any who should be eliminated?
INGSTON. That will depend upon how many there are and t they have upon the market. The man out in the country ıccounts in the newspapers and various other ways to be- there are too many middlemen.
UGEN. You spoke of shipping carloads of hay from one ınother—from Iowa to Mississippi, for instance. How ls would that go through?
INGSTON. We have not been able to study that. That is ant this appropriation for.
JGEN. Have you any information on that point?
INGSTON. Not on that particular question.
ELE. Has it ever come to your attention from the producer are too many Government officials?
NGSTON. Yes.
AIRMAN. There are some folks in this country who think oo many Congressmen.
NGSTON. Yes.
JGEN. Your purpose is to get information as to consump- rices and report consumption and prices in various locali-

NGSTON. It is a matter of looking into the advisability of sort of thing. That is our purpose. For instance, in some the New England States in certain years there is a great r hay, corn, or oats, while the next year it may shift to section of the States or to some other part of the country. o get that information and furnish it to the shipper who supply that demand.
GEN. Well, the price is usually governed by the demand.
NGSTON. Oh, yes.
UGEN. What the consumer is interested in is the price. papers give that every day. Anybody can pick up a paper, give the price, as a general thing, at a number of these ıarkets, though not all of them. If the paper does not ice at New York, you can buy a New York paper and get it.
NGSTON. Yes; but New York may not supply the whole gland.
JGEN. The farmer will send it where he can get the best

Mr. HOWELL. I understood that you work in the interes
Mr. LIVINGSTON. Yes; if he so desires.
Mr. HOWELL. And thereby increase the number of shipp
Mr. LIVINGSTON. Yes.
Mr. HOWELL. That is one of the aims that you expect to
Mr. LIVINGSTON. Yes.
Mr. HOWELL. Have you considered the influence that it wo
upon the price to have a great multitude of sellers offeri
products on the markets? Have you taken into consider
effect that that would have on the market? In other wo
the great troubles of the farmer to-day is the lack of organiz
Mr. LIVINGSTON. Yes.
Mr. HOWELL. And lack of maintained prices?
Mr. LIVINGSTON. Yes.
Mr. HOWELL. They compete, the one against the other?
Mr. LIVINGSTON. Yes.

OWELL. Have you taken into consideration the question of it would not, in effect, result in a competition that would ices rather than advance prices to the farmer?
VINGSTON. Not necessarily. That would depend entirely demand in the market.
OWELL. At the present time the farmer sells his product to t and he in turn becomes the competitor of some other agent er market, and their aim is to get the highest price they can lling market in order to outbid each other in the buying

VINGSTON. Yes.
OWELL. But you would bring the producer and his neighbor in the same market, and it seems to me that you would bring eener competition than there is now with the middleman.
VINGSTON. I think the competition is there, whether it is be- producers or the men who handle the commodity next.
OOLITTLE. Mr. Livingston, from the producer's standpoint, ink that grain should be permitted to be sold which is not

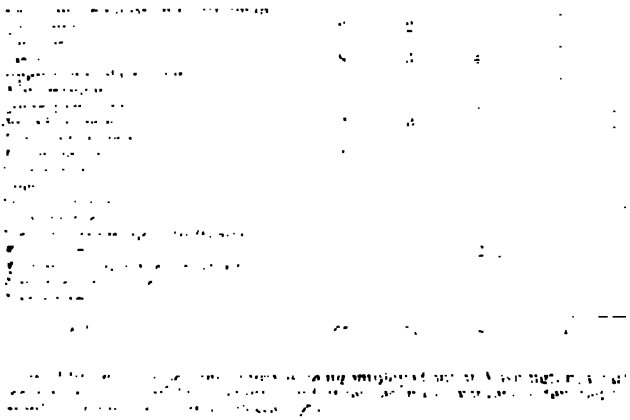
VINGSTON. You mean future transactions?
OOLITTLE. Yes. I mean the grain which is not in existence.
VINGSTON. I would like to answer that question in this

OOLITTLE (interposing). From the standpoint of the pro-

VINGSTON. We are just starting on a detailed study of that We have visited two markets and hope to study all of the arkets where that is being carried on, but I do not feel that sufficiently studied the matter to answer that question defi- this time.
RAND. May I answer that question in this way: The com- familiar with the report on the cotton exchanges which dis- e cotton situation in great detail. No thorough investiga- been made in the matter of trading in grain futures. We arry on that work next year in line with that excellent report made on cotton-futures trading by Mr. Herbert Knox Smith.
VINGSTON. The same question comes up in the matter of sell- ns on land.

ENT OF MR. CHARLES J. BRAND, CHIEF OF THE OFFICE MARKETS AND RURAL ORGANIZATION—Continued.

AUGEN. Now, I would like to ask Dr. Brand a question or n you furnish a report giving the number of employees in of Markets, where assigned on this work, and what you o do?
AND. Yes.
UGEN. You will have a detailed statement put in the record?
AND. If the committee wishes it.
AIRMAN. Without objection, it is so ordered.



[illegible] remain to [illegible] just three pr[illegible] ginning of cotton seed and [illegible] present, and I do not intend to [illegible] further than to say that w[illegible] future trading in cotton seed and [illegible] the possibility of standardizing the grades [illegible] products, the effect of varying laws of the different [illegible] and distribution of cotton seed and cotton-seed p[illegible] many studies to discover the losses, discriminations, [illegible] of handling seed in the primary markets. W[illegible] that work in the past season and, to give you som[illegible] of the results that have been produced, I will quote [illegible] We have carried on a survey in 17 of the small c[illegible] Memphis district, sampling a great many loads o[illegible] day in each of these markets. The variation in pr[illegible]

AUGEN. Mr. Chairman, may we have an expert on cotton seed
v minutes? I am more interested in that subject than any-
it comes before the committee. Have you an expert here who
ledge of the cotton-seed industry, Mr. Brand?
AND. He is not here, but we have one who has knowledge of
has spent his whole life in that work.
AUGEN. Has he any information as to the owners and
s of the cotton-seed industry of the South?
AND. We have a great deal of information on that subject.
AUGEN. Have you any knowledge in the matter?
AND. I would say that information is knowledge. We have
plete records of the apparent ownership of certain cotton-
stries. I suppose Mr. Haugen is looking back of that subject
who were reputed to be interested in the cotton-seed industry.
AUGEN. Yes. It has been alleged that the packing houses and
argarine people own and operate the cotton-seed industry
uth.
AND. I do not think they deny a part of that allegation. I
ey have a large interest in it.
AUGEN. To what extent?
AND. I can not tell you. I do not know whether it is a
public record.
AUGEN. Well, you have some knowledge of it?
AND. No; we have no knowledge of the exact ownership of
stry. A few big corporations, like the Pennsylvania Rail-
the United States Steel Corporation, publish the exact dis-
of their stock and control, but there are only a few of them,
ave no method of forcing that sort of information from

AUGEN. But I understood you to say that a large amount of
wned or controlled by the packing houses?
AND. I said that the packing-house interests admit a very
rest in these concerns, whose products they use in the manu-
their products.
UGEN. You have some one who has given that matter some
?
AND. We have a specialist, but he is not here, as it was not
that he would be called. The next project is marketing
ducts. That is a relatively new project, and, while not very
consider it very important. Mr. Potts will present this

NT OF MR. ROY C. POTTS, IN CHARGE OF MARKETING PRODUCTS, OFFICE OF MARKETS AND RURAL ORGANI-

TTS. Gentlemen, the dairy industry of the United States,
to the census statistics of 1910, ranked fifth in total value
roducts produced. In some of our States it ranks first, and
f the Southern States it ranks lower in the value of the
al products. Probably no other branch of agriculture is
anized in some particulars than the dairy industry. We
operative creameries in Minnesota as types of highly or-
operative agricultural organizations which are getting for

different methods of obtaining their cream supply.

investigations have been conducted for the purpose of
ning the difference in price that creameries receive for the
roduced from various qualities or grades of cream, shipped
rger markets. As a result of this and other studies which
conducting, we hope to be able to assist the creameries in
ing market grades for cream and in marketing butter.
ving that butter to the markets, we have studied the facilities
of transportation and the conditions affecting the butter
transit to market. The lake and rail is a system of trans-
n of butter via Duluth, where it is shipped to Buffalo under
tion by boat, and from Buffalo by rail to the eastern mar-
n one line of railroad in northwestern Minnesota, on which
creameries are operated, it was estimated that a net saving in
transportation of $25,000 a year would be possible if these
es would avail themselves of the lower rates by the lake-and-
e. In the butter markets we have studied the market distri-
f the butter.
larger terminal markets, such as Chicago, New York, and
ner cities, highly organized trade organizations, known as
le exchanges, have been formed by the wholesale dealers.
rade organizations, consisting of the wholesale receivers,
rised a system of butter inspection and standards of grades
r. Creameries may be obliged to sell their butter according
spection system adopted in the markets by these organiza-
he butter inspector in each market is employed by the local
tion, and inspections are made only when requested by some
of the trade organizations and by the inspectors employed by
organizations.
been suggested and recommended that at the terminal
or the large market centers official inspection should be
by the Government, so that the creameries and the re-
nay have this butter inspected according to a Government
or grade which would be uniform for all the markets and
l to all the interests.
g the past year cooperative investigations have been con-
y the Office of Markets and Rural Organization with the
tv of Wisconsin. These investigations were similar to those
d in Minnesota.
/s of the butter markets of the South were made last sum-
pward of 90 per cent of the creamery butter consumed in
h is shipped in from northern markets. Many of the south-
neries need information about their home markets and how
y market their own butter in these markets. They need in-
n which will tell them how they may cooperate with one
n forming marketing associations and how they may market
ter independently or cooperatively in the South.
nvestigations in marketing dairy products are not devoted
marketing alone, but also include the marketing of milk,
nd other forms of dairy products. There is a great demand
office now from various sections of the United States for
e in perfecting organizations of milk producers.
w England and New York there are many farmers who are
t of the milk and dairy business because they find it to be un-
e.

are other phases of dairy marketing which I might discuss, ibly some of the members of the committee have some ques- ask.

HAIRMAN. I would like to ask this question. Does this work section in any way conflict with the work of the Diary Di- the Bureau of Animal Industry?

OTTS. No, sir; we are cooperating in the closest way with the ivision of the Bureau of Animal Industry. Their work in on with the marketing of milk pertains to the matter of safe- the public health, the efficient pasteurization of the milk ants, and the ordinances of the cities for the furtherance of easures. In our work we take up the matter of marketing ribution of the milk from the standpoint of the costs in- the different phases of the marketing process. We are erned with the health regulations of the cities or the sani- ses of milk production.

HAIRMAN. One line of work approaches the problem from lpoint of health?

OTTS. Yes, sir; protection and safeguarding the public

HAIRMAN. And you approach it from the economic stand-

OTTS. From the economic standpoint, dealing with the cost of g and distribution.

AUGEN. Could not that work be done in one bureau? Is it to send two men to same point to study those conditions?

AND. We do not send one and the Dairy Division of the f Animal Industry another to do the same work.

AUGEN. You send one and they send another?

AND. If they do, those men do not do or attempt to do the are trying to do. We borrow men from them. We have t repeatedly. When they wish information in regard to ets we furnish that information. We work in the closest on and harmony, and I think Mr. Rawl would say there is ation.

AUGEN. It seems to me that the work done by this gentle- Dr. Rawl are quite similar. You have had men in New te and so has Dr. Rawl, but you approach the subject from nt standpoint than Dr. Rawl. I was trying to find out he work could not be done by one man.

AND. That is a question of policy, and it seems to us, if you to develop an effective instrument for dealing with the g and distribution, that the fundamentals of that work handled by the particular division working on that sub- not by another division. Otherwise there would be no rea- aving an office of markets, it seems to me.

ssible to turn that kind of work over to other organizations it them to do it. We believe that the problems are all very lated and that they are most effectively dealt with and will end, solved sooner and better if they are dealt with from point of marketing and distribution rather than from the t of production, which represents two different points of two different points of approach.

Mr. BRAND. As far as the wasting of the mone
exercise the very closest supervision and scrutiny.
any money to be wasted, and I think some of my r
we are almost niggardly in our support of some
they bring to light. We are trying to get our ful
every dollar we spend.

Mr. HAUGEN. I am not questioning the integrity
the Government in its wasting money.

Mr. BRAND. I did not so understand you.

Mr. HAUGEN. I have not questioned the integri
the department, but I feel it my duty, if I can, to
things that I think can be improved upon, to do so
late to do it. You people are enthusiastic over
you were not, you would not be entitled to the
committee. But you will make mistake—you
You have enthusiasm in your work. If you di
ought not be in the Government service. But if
where we think improvement can be made an
thousand dollars saved here and there, I think it
it. A business man with a good deal of experie
ago that $300,000,000 could be saved in Govern
think there is just as much waste of money in t
anywhere else. I think there is duplication of w
avoided, and that is what I have been trying to g
expect you to abandon any worthy project. You
carrying out of your projects, we give you credit f
you for it.

The CHAIRMAN. I think Mr. Haugen is entirely
gentlemen can find any point where they can red
ation or combine appropriations and still get as
possible, they ought to do it, and the committe
do it.

, if we could make a little start in that direction, if this com-
uld save a million dollars—and how easy it would be to
—we would render valuable service.
HAIRMAN. We are in sympathy with Mr. Haugen's idea on
if we can find any place where we can make a saving, this
e will take it up; and I believe we would have the cooper-
he department.
AND. The cotton-warehousing item can be presented very
Mr. Nixon.
AIRMAN. We will be glad to hear Mr. Nixon.

**NT OF MR. R. L. NIXON, IN CHARGE OF COTTON WARE-
G INVESTIGATIONS, OFFICE OF MARKETS AND RURAL
IZATION.**

XON. Mr. Chairman, in the cotton warehousing investiga-
started with a survey of the storage situation in the South.
work was undertaken I did not know what to expect, from
ience I had had. I knew that warehousing varied greatly
nt sections of the country. We first made a survey of the
and I think it would be advisable to give a few of the
that survey.
uld naturally suppose, in the first place, that the cotton
s would be located in the counties where most of the cotton
ed. As a matter of fact, that is not the case. The dis-
of the warehouses does not correspond to the distribution
tion.
supposed when we started that the aggregate storage
f the warehouses now in use was not equal to more than
ercentage of the annual production of cotton. We found
was not true, for the storage capacity almost equals the
oduction.
interesting conclusion at which we arrived was that as a
roposition cotton is not stored in order to protect it from
that is, from excessive moisture and other climatic condi-
in many instances it is stored to enable the owners to
oney on it. The banks generally will not advance money
unless it is stored and insured. This makes it necessary
who hold cotton to place it in the warehouse in order to
ns.
that there would be few warehouses in a number of States
possible to obtain loans on unprotected cotton on the
itions that apply in the case of stored cotton.
ne general standards for warehouses recognized by the
ers, the insurance rate is much lower than it is in a case
standards are not followed. Notwithstanding this fact,
comparatively few warehouses that conform to these stand-
it means that in most instances the people are paying much
rance than is necessary. We find in a good many places
nsured at 25 cents per annum on $100 and in some instances
10 cents on $100 in value.
AIRMAN. How much would that be a bale?
ON. That would be 5 cents a bale.

That would pay the cost of insurance. In many
insurance is paid by the warehouse company.
instances the warehouse company does not carry
the cotton stored.

The CHAIRMAN. What would be the storage ch

Mr. NIXON. That varies as much as the cost of
say about 75 cents for the first month, and
each succeeding month. That is an average. It
many instances and more than that in many oth

Our work along these lines has shown very defi
and uniform warehouse receipt is one of the
Many conferences with bankers who make a
money on cotton show that the uniform receip
Fortunately, over 30 of the States have a uniform
but in order to encourage that work as far as pos
ible during the next year, acting in cooperation
warehouses in different sections of the cotton-p
show them the advantages of the uniform receip
eration with Mr. Taylor in the demonstration of
show the value of the grading of cotton, and to sh
value the receipt will have when the correct gra
uniform receipt.

We have just made a small beginning in that
year. We feel that it is very promising and ho
demonstrations during the coming year.

In very close connection with that line of work
up the work of Mr. Kerr and in cooperation with
ardized system of accounts to be used by the ware
is not very necessary for the large warehouses,
their business well systematized, and they can g
without any assistance. But there are a large nu
houses in the producing areas with no system of

tisfactorily from these samples. There are other people, who contend that it is entirely practicable, and some of grade in that way. But the gin sample is not universally enerally accepted.

ork in Texas leads us to believe that there are interesting es along this line, and we are particularly anxious, in co- with Mr. Taylor, to make a thorough study of the practi- f grading by gin samples, which would eliminate much of that results from present practices.

r line of work I am particularly anxious to follow during ear is to make a number of tests to determine the actual ived from the storage of cotton. This work will require a f experiments with cotton that has been properly stored cotton that has been subjected to adverse climatic con-

nual loss from improper handling of cotton has been esti- from $30,000,000 to $75,000,000. I do not believe any per- n position to say what the average loss per bale is, and it me that a number of tests should be made to determine actual value now sustained by cotton as a result of inade- tection.

mpletes what I have to say.

AIRMAN. We will take a recess until 4 o'clock.

upon, at 2 o'clock p. m., the committee took a recess until . m.)

AFTER RECESS.

xpiration of the recess the committee reconvened.

AIRMAN. In the absence of Dr. Brand, whose engagement de Commission has detained him, I would like to ask Dr. to take up item 40, "For collecting and distributing, by mail, and otherwise, timely information on the supply, l movement, disposition, and market prices of fruits and ."

sk you, Dr. Sherman, to give the committee some idea ou propose to do under this item, with respect to your own

NT OF MR. WELLS A. SHERMAN, IN CHARGE OF MARKET 'S, METHODS, AND COSTS, OFFICE OF MARKETS AND ORGANIZATION.

ERMAN. Mr. Chairman, as you know, this item grows out rket-survey project—that is, the item of market surveys, nd costs, for which there was allotted about $50,000 this t item has been reduced to $35,000 under miscellaneous ch we have been over before, a lump-sum reduction of d this new item has been inserted to cover this particular hich has been developed to the point where the committee le whether we are to inaugurate a constructive and per- ce of work or whether we shall pass it by merely on the f the information that we have obtained, with the mere n the record as to the practicability of such a project.

en the trade comes after us to get our men that we are get-
ewhere.
LGESEN. It indicates that the service is worth while and that
are up to their jobs. Is this the same service that has been
ted by the fruit associations of the Pacific coast?
ERMAN. The fruit associations have been able to do some of
for themselves. Of course, their association does it for its
fit and the benefit of its own members, and does not pub-
information. The citrus people, of course, have a peculiar
They have an all-the-year-round problem for their mar-
sociation, and they have to keep in operation all the season,
ey have something to sell continuously. Their situation is
from that of any other body of producers of perishable

AIRMAN. Does that account in large measure for the suc-
at organization?
ERMAN. I think so.
BEY. Have you any way of ascertaining what it costs that
n to carry on its work along the line of use of the tele-

ERMAN. The statement has been made that it costs that as-
between $60,000 and $70,000 a year for its telegraphic tolls
the statement frequently goes out that that is the cost of
service. In conference with Mr. Powell in his office, how-
rned that that represents their telegraphic cost—the cost of
ms that would come to them anyway in large measure in re-
eir sales. That is to say, when a carload of oranges is sold
their representatives in any of the larger markets, a tele-
es back immediately saying what that car sold for, and
e greater part of the market information which they dis-
their members. They would have to pay for those tele-
way, in order to keep track of their business. So that it is
y correct to say that they pay $60,000 or $70,000 a year for
rmation service; but they have a telegraphic expense of
$70,000 in connection with their regular business, which
this news.
LGESEN. Do you intend that this shall take the place of
ce, and to include them with the rest of the country?
ERMAN. Thus far we have not touched the citrus fruits at
o not contemplate doing anything with the citrus fruits
s coming year.
LGESEN. I am speaking of the time when you finally get
ted. Do you then intend to have it cover the whole coun-
take the place of the service of the Citrus Fruit Growers'
n?
ERMAN. If it were a perfected service, and if it were ex-
cover all the perishable fruits and vegetables, there is no
could render the California fruit growers a better service
are getting through their own service to-day.
BEY. Mr. Chairman, I think your question during the in-
cussion ought to go into the record to the effect that Mr.
t the department because he could get a very much in-
ary. I think that part of it might well go into the record.

Mr. H[illegible]

Mr. [illegible] I [illegible]

[illegible] Mr. H[illegible]

[illegible]

[illegible] to go [illegible] Mr. H[illegible] I[illegible]

[illegible] you must have a certain amount of machinery for that purpose [illegible] if we are to have disinterested reports from the [illegible] and reliable reports that will command the respect of the trade. [illegible] our representatives in the market.

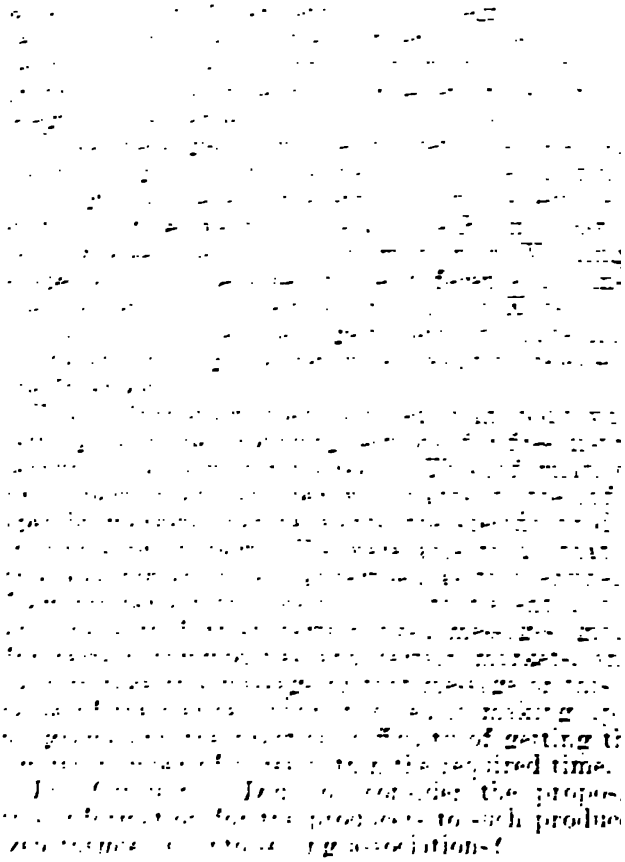
I want to say right here that these estimates do not contem[plate] the complete manning of all important markets with our own r[epre]sentatives this year. That would call for an amount of money w[hich] we do not think proper to ask for until the second year's estimat[e] this work. But eventually we shall have to have our own r[epre]sentatives in at least 25 or 30 of the principal markets in the co[untry] and more than half of that number will have to be all-the-year-r[ound] offices if this is made a complete service for fruits and vegeta[bles]. Perhaps in half that number we can get along with a servi[ce] six or eight months.

That gives us a force of men from whom we can get the infor[mation] to assemble in Washington to give the producer a correct [f.o.b.] price.

In order that we may get from the commission merchants [the] treatment in order that we may have sympathetic co-operation [in] the markets and not degenerate into a detective agency—we must [have] something to give the trade in these markets. The trade in C[hicago] knows pretty well what is going on in New York, Buffalo, and

markets, but the trade in Chicago, New York, and all the
es is vitally interested in knowing of the crop movement.
e never had any reliable report of crop movement of perish-
il this last season; our reports were not complete, but they
nost nearly complete that had ever been made.
ve arranged with the railroad companies, as Mr. White
to you, covering the greater part of the mileage of the
tates, for telegraphic reports such as they furnished us last
fact, we found that every road from whom we required the
on gave it. They agreed to give us every night, through
rict superintendent or other officers having the information,
legram, which comes to us at Government rates, giving the
of perishable products, by commodities and by destinations,
ated on their lines during the preceding 24 hours. The
mpanies do the same thing.
ar, as you know, we followed only four crops—strawberries,
atoes, cantaloupes, and peaches. We did not attempt to go
ss-carload movement last year.
eans that we open our office at half past 7 in the morning,
9, as most offices open. We have our telegraphic installa-
in our own rooms. We have our own telegraphers there,
utgoing messages we get direct service to the markets with-
lay in Washington.
as, as I said, that at half past 7 in the morning our
rs begin to take business off the wires. At the same time
t number of clerks report to begin the tabulation of this
c news by States and by different shipping areas as they
ed. We always have a sufficient force of telegraphers, so
e 9 o'clock we have cleaned up the Washington telegraph
he night letters have all been transmitted to us; they have
n off, making several copies on the typewriter, and have
ibuted to the clerks who are to work on them. Each tele-
course, gives the quantity of peaches, cantaloupes, and all
commodities moving. The number of cars of each of these
es has to be tabulated separately.
a few minutes after 9 we are ready to put that informa-
e wires, and just about 9 o'clock we begin sending it to
ket in the country where we have a representative. We
our own man and he distributes it. Where we have no
tive we send it to anybody sufficiently interested to pay the
course. we can not distribute that information to indi-
Government rates; they have to pay regular rates on those
if they get the information direct from us.
l that information to anybody who wants it. It is free
perty the minute we have it tabulated. The newspapers
; anybody can get it who puts his name and address on
h us, by means either of collect day letter or by the direct

ned these markets with temporary employees, by assigning
our men to some of the larger markets, and by various
hich I will explain to the committee in detail. The scheme
men in the markets shall be out just as early as it is pos-
t the run of wholesale prices. In some cities that means
m. In other cities it is as late as 8 or 9 o'clock before the



ERMAN. There is no doubt that the individual, small pro-
ıot in position to make the best use of this information.
who can make the best use of the information is the man
ols carload quantities and who also controls numerous ship-
can put them where they ought to be put.
AIRMAN. I have another idea in my mind on this proposi-
that is that these telegrams and information might be dis-
very widely through a given territory through the county

ERMAN. Yes, sir.
AIRMAN. Have you studied that phase of it?
ERMAN. Yes, sir. We had a county agent in the western
ew York who distributed to that fruit section, at least
own county. We had one or two county agents on the
ore of Maryland and Delaware. I am not certain as to the
e; possibly both were in Delaware, and I believe one in
y. We also sent it for a short time to one of the county
n in the strawberry district of the Carolinas.
VELL. What is to prevent you sending out that information
ıe Associated Press?
IRMAN. They are welcome to all of it that they will use;
ssociated Press did not use very much of it last year, be-
alt with minor products, and the Associated Press would
ace to it.
ELL. I recall that the Weather Bureau has, through negoti-
county and local papers, been able to circulate their infor-
hout any cost.
RMAN. And a good many local papers used this informa-
ear in certain areas.
IRMAN. I think the suggestion of Mr. Howell is worthy of
leration.
RMAN. It is.
AIRMAN. And I have an idea, when your service builds up
ather Bureau has built up, that probably the press will
s kindly as they do to that service.
VELL. I should think it very important information.
GESEN. It would be free information over the wires to the
s, or I doubt if they will ever carry it.
AIRMAN. The weather reports are a more general proposi-
ıe newspapers have got to run very largely according to
ls of the public.
RMAN. I think certain newspapers will carry this informa-
rtain periods when certain products are of great impor-
eir subscribers. One of the papers in New Jersey paid
ervice. They told us which markets they were interested
up a special wire, and they paid for it.
erging just a little bit from the story, but one of the pos-
this: One of the important daily papers of Chicago gave
us space to this information for weeks when we were re-
strawberry movement, and they went so far as to say to
ntative in Chicago that "whenever the Department of
is ready to take a certain space in our paper and tell the
at Chicago what they ought to know about the food sup-

[illegible]

Mr. HERSEY. So far as our experience goes, which [illegible] to get this information—the producers [illegible]

Mr. SHERMAN. That is a hard question to answer. [illegible] has been only one important city in which we have found a [illegible] attitude of indifference—rather marked indifference—to the [illegible] the commission men; and we have had just one letter in the season from a man, who pretended to represent the growers, who that in his particular case we had done him an injury—just letter, against a hundred or more I could put before you on the side.

Mr. HERSEY. I was wondering whether it was going to be along the line of the Citrus Fruit Growers' Association, because understand it, they have a headquarters and every man who sh carload of citrus fruit notifies the office that he has shipped to certain point; and the manager has the authority, if he finds that ca is going to a place where the market is glutted, to deliberately s it to another market.

Mr. SHERMAN. I do not think the central association has power.

Mr. BRAND. The central association does not have the pow control shipments or prices. Under the antitrust law they [illegible] controlled by the primary organization, which is one of the which are united in the subcentrals or district exchanges [illegible] into the exchange which controls the distribution of [illegible]

Mr. HERSEY. Who distributes such information?

Mr. BRAND. The information is communicated to [illegible] association, and the local association manager sends word [illegible] to me.

Mr. HERSEY. Are you going to put this thing [illegible] [illegible] good [illegible] of vegetables or [illegible] Kansas. You would not want to-morrow morning that [illegible] to Kansas City, and I would have shipped to some other [illegible]

Mr. SHERMAN. There are often a great many cars of [illegible] produce from a single State, and the destinations are g as to the railroads. You will understand, of course, those des tions will be very much modified by subsequent diversions

ly impossible for us to keep track of all the diversions that
, so that we here in Washington could tell just how many
ld arrive in each city the next morning, because, if you are
report in detail the movement of cars, you must report not
ıe number and where destined but the initials and number
ar—for instance, A. T. & S. F., No. 678910, to Milwaukee.
ne you report a diversion you must report the full name
ber. Of course, our telegrams would reach into hundreds
sands of dollars if we attempted to do that. It is almost
able.

ı, however, put our men at the gateways—the diversion
hich are well recognized—and get the distribution from
nts. For instance, in the reports of shipments from down
ıtic coast you will find a very large proportion consigned
ıac Yards. We call up the Potomac Yards and get the
s out of the yards, and then we can tell you whether the
ies are going to Pittsburgh, to Buffalo, or to Boston.

LGESEN. This brings us to a cooperative concern, as Chair-
r says. They would also have an organization and at the
that organization would have some one who knows how
s per day can be consumed in each of the cities shipped to,
ey find more than a normal amount going to a place they
h it and divert it to some other market. If they shipped
ıdividual owner or furnished information to an individual
would be almost impossible for him to have in mind the
ion in all the various cities of the country, and, unless he
at a certain number of cars going to a certain city will
that market, the information will be of no value to him.
got to be something else to show him that, if the car goes
pped out, it is going into a glutted market; and if it does not
h that it is of no benefit to him.

ERMAN. In other words, you think that if this information
f any benefit we must have, first, the measure of the con-
pacity of the different markets?

LGESEN. Yes.

IAIRMAN. And that leads me to inquire just what infor-
ou are going to furnish the producer or the selling asso-
ch morning. First of all, I take it that it will be neces-
ou to furnish the consumption in the market to which he
sells; and, second, the movement of cars in that direction.
get your view of that. Just what information in detail
ı furnish the producer and the selling association?

ERMAN. We would furnish him a statement of the number
That is all we have provided for thus far—to furnish a
of the number of cars from every producing district dur-
receding 24 hours, with their destination, and to furnish
the number of cars received at every market where we are
d, with the prices at which they are selling. In addition
e can furnish him with a certain amount of information as
ıber of cars which have been diverted from a number of the
gateways. For instance, a large number of western can-
re consigned to Kansas City and to El Paso for diversion.
known what the final destination will be, but we can get

the diversion, which with reference to the Southeast would be measure, be obtained from the Potomac Yards and with approximate accuracy which northern markets they will reach. The next morning we say so many cars of western carlot shipments diverted to Chicago, New York, Philadelphia, and Boston, El Paso, Kansas City, or other diversion points.

Mr. HELGESEN. All of which is good as far as it goes. However, daily, weekly, or semiweekly advice should be furnished to the individual producer who wants the information of the consuming capacity of the various cities to which these commodities are shipped. Then he has something he can compute with and be guided by.

Mr. SHERMAN. Five years from now we can do that. We have made our first investigation this year. There has not been a investigation that would show how many cars of any one of these perishable commodities any city consumes. Mr. Brand told you, in discussing the market-survey item, that we had discovered this year where St. Louis consumes less than 2 quarts (1.3 quarts) of strawberries per capita; Boston consumes 10.

Mr. HELGESEN. You take, for instance, going as far west as where I live in North Dakota, Grand Forks and Fargo are the two gateway cities of the State. Those cities themselves can not consume their entire receipts, but it is an outlet to the actual consumers in the villages of enormous amounts of fruit.

Mr. SHERMAN. Yes.

Mr. HELGESEN. You ought to know how many cars those cities take care of and distribute each day, because that is what makes the market. If those cities get more than their customers can take all over the State, there is a glut.

Mr. SHERMAN. Absolutely.

Mr. HELGESEN. And this proposition, it seems to me, would be very difficult to handle.

Mr. SHERMAN. This is just the difficulty: We can get that if we will put a man in the office of the railroad company, and every railroad company has opened its offices and its books to us so far. We have done that thing in 20 of the largest cities of the country and we got these very interesting figures from Chicago and Kansas City last year. During the past two months we have had four or five men on the road doing that, going to the books and getting the exact number of carloads unloaded in these cities. I presume any of the roads have records which we could dig into, and by putting a man on them we could go back and get the number of unloads for a period of years. We can also get the number of cars diverted out. But that has never been compiled in that form.

Mr. HELGESEN. I do not think that would be the best information. You take it in these cities I speak of, which are just samples of hundreds of others in the United States.

Mr. SHERMAN. Yes.

Mr. HELGESEN. The commission men know now and can tell you in a very short time how many carloads of fruit they handled every day last year. They will handle practically the same amount next year. It may vary a little. They do not unload them always because they have points at which they will ship a carload to be distributed a little farther away. They do that because it is

ıl way. Yet they can tell you how many cars and where
every day.
will look at last year's record, it will not vary much. So
a pretty good average, and I do not think you ought to
years to give any such information as that, because if you
t it the rest of your work is going to lose a great deal of

IAIRMAN. You are investigating it in 20 cities now?
ERMAN. We have that for these four products.
IAIRMAN. It seems to me that Mr. Helgesen's idea is cor-
course, I think the committee recognizes the fact that it
almost impossible to get the consuming capacity of every
n; but there are certain distributing points, like the Po-
rds, for instance, for a great territory here, or like St. Louis,
t territory in the West and Middle West. It does not seem
would be a very great task. It may be a big task, but not
for this Government to undertake, to find out the consum-
ty of these distributing points, and if that information was
ack to the producer, in addition to the other information
have mentioned, it seems to me you are working along
)d lines.
(GESEN. And it seems to me that is information they could
hen the season starts and put it in circulation by mail.
n he should get the other information, taking the chart,
say: "Last year this city consumed 15 cars; 30 cars are
e this year," and he immediately has something on which
s action; but if he does not know anything about the con-
it is meaningless.
AIRMAN. That is perfectly correct.
VELL. It seems to me the whole system needs correcting. It
:h of an imposition upon the producer to ask him to take
ks incident to the production of the commodity and then
on him all the risks incident to the marketing of it. Is it
le or practicable to devise a system so that these perishable
vill be bought by the men who are to distribute them, and
.ke their own chances on the market?
ERMAN. This is opening up a very far-reaching question
hich does not deal with the particular purpose of our item.
VELL. It is a condition by which the seller could dispose of
:t at the time of shipment and be done with it, and, if that
rought about, you will have accomplished a very great deal
' of marketing.
ND. Mr. Howell, we are studying the question of f. o. b.
uestion of consignment, the question of selling at auction,
the various methods of sale. It is a system which has
through many, many years, and whatever change we bring
must be brought about very gradually. It can be brought
he service we are able to render these people in the ways
Sherman is explaining. Assistance brought to people en-
ance on their part; get them lined up and they help us.
VELL. There are evils all along the line.
ND. We have found a great many evils. I am of the
at the commission man is quite as honest as other men, but
· very much greater temptation.

yer and seller on an equality in those
ble to put our own representatives to
upon the bulletin boards and was tele-
ing districts and gotten into every-

or two cases the buyers on the
s. In a very few days they
kets than they had, and they
f information we have had
bulletin boards for the

ave this force to cover the
hey come on in advance of the
t. We should be able to give the
f the beginning of the movement as to
e Hammond strawberry territory bid
ments last year. We should be able to
tory whether they are a few days ahead
r as compared with this other produc-
competes with them in the market.
he markets that the movement will be
ndicating on map] than last year, and
accurate estimate of the extent of the
has been a frost. We should in every
up-to-the-minute information that can
by personal visitation, which is not
excepting as trade papers may get it
stribute it as they please and which can
dinary crop-reporting machinery of the
the crop-reporting machinery of the
hich deals with acreages and with con-
s and by States.
roposition is one of definite locality.
oss State lines. They are not bounded
itical lines. The Carolina strawberry
he line from North Carolina into the
rolina. This is a proposition to be put
and literally, and we are "putting it
peach territory, as you know, in south-
, and running over into Oklahoma.
industry is centered on the Mexican
Turlock. We have here in Nevada a
pe district. We have here on the Pecos
ipped 100 or 200 cars in 1914 but none

e work in Texas.
ast year, when we had a man at Jack-
t Crystal Springs, Miss., during the
two districts were as much interested
ng in the other as they were in know-
hicago, St. Louis, or anywhere else.
re trying to sell f. o. b. and trying to
nt business. They had a lot of buyers
g they wanted to know was what the

Mr. HELGESEN. That is a very diplomatic way of putting it.

Mr. BRAND. As a specific reply to Mr. Howell's suggestion: T years ago Utah had a very large peach crop. In ordinary years, in years of small production, cash buyers come to the production tions and take a large part of that product. The same is true of Colorado territory, and it is true of the boxed-apple territory.

The next year the crop was exceedingly large and every one those cash buyers, who buy f. o. b. production point, stayed at home in Chicago or elsewhere, the producers who were dependi upon them being left in a very sad way. In other words, we ne a great many strings to our bow in order to move the crop.

Mr. HOWELL. Peaches were abundant.

Mr. BRAND. Fifty-five carloads went into St. Louis in one day, a practically all of them were dumped into the river. The Misso Pacific Railroad, I have been told, is still trying to collect the freig

Mr. HOWELL. They would not have gone to St. Louis if it we not for this commission system.

Mr. SHERMAN. Let me just give you the general picture of th service. I did not quite finish describing the machinery.

This service, to be effectual, should be manned so that we w have our own representatives in all of the important markets. W must have reports from all the common carriers. We must have o own representatives in the important shipping areas, one by one, they come on the market, to take our information home to the m who needs it most. Our information has been welcomed by t producer very largely in proportion as we have been able to put man on the ground near to him to give him this information day b day and twice a day.

I will go to the map, if I may, for a few minutes and show yo just where we have had men this summer and just what territo they have served.

That force of men, of course, must move, and each one can form distributing center for certain territory around him. At these poin of heavy production and heavy shipment you have a certain numb of buyers who have come there representing firms in the larg markets—the distributors, etc. These men have their confidenti information on prices in the different markets: they are quotin prices to these different markets, trying to buy and to sell. A lar number of them have a very decided option in the selection markets to which they will ship.

It is not always true that a commission firm wants everything come to its own home store. There are big commission firms in Ch cago and in Pittsburgh who are in the distributing business and w contract for the marketing of vastly larger quantities of perishab than they can possibly handle through their own home houses an who distribute these products that they can not handle themselv to commission merchants in other cities with whom they have bus ness relations.

These men all have confidential information, and you have at the heavy shipping centers this state of affairs: A man is buying w has information which will be invaluable to the man who is sellin but the man who is selling has no access to it. The man who has t information has every inducement in the world to keep it from t man who is selling.

vice has put the buyer and seller on an equality in those
ere we have been able to put our own representatives to
e information went upon the bulletin boards and was tele-
and down the producing districts and gotten into every-
ıds.
ult has been that in one or two cases the buyers on the
ere decidedly offended at us. In a very few days they
we had a better line on 20 markets than they had, and they
right on the spot for every bit of information we have had
. They have been waiting at the bulletin boards for the
o go up.
another essential: We must have this force to cover the
territories one by one as they come on in advance of the
of the crop movement. We should be able to give the
ing a week ahead of the beginning of the movement as to
hipments out of the Hammond strawberry territory bid
ıpare with the shipments last year. We should be able to
avy producing territory whether they are a few days ahead
ays behind this year as compared with this other produc-
ry which normally competes with them in the market.
ld be able to tell the markets that the movement will be
lier in this place [indicating on map] than last year, and
have some fairly accurate estimate of the extent of the
areas where there has been a frost. We should in every
s ourselves of the up-to-the-minute information that can
by telegraph and by personal visitation, which is not
t the present time excepting as trade papers may get it
sted parties and distribute it as they please and which can
lled through the ordinary crop-reporting machinery of the
t—that is to say, the crop-reporting machinery of the
Crop Estimates, which deals with acreages and with con-
ıveraged by counties and by States.
rishable-product proposition is one of definite locality.
ities run right across State lines. They are not bounded
our arbitrary political lines. The Carolina strawberry
ıs straight across the line from North Carolina into the
n part of South Carolina. This is a proposition to be put
, both figuratively and literally, and we are "putting it
." There is a big peach territory, as you know, in south-
ıri, north Arkansas, and running over into Oklahoma.
ifornia cantaloupe industry is centered on the Mexican
then again up to Turlock. We have here in Nevada a
entralized cantaloupe district. We have here on the Pecos
e district which shipped 100 or 200 cars in 1914 but none

IRMAN. Mention the work in Texas.
RMAN. We found last year, when we had a man at Jack-
ex., and a man at Crystal Springs, Miss., during the
vement, that these two districts were as much interested
what was happening in the other as they were in know-
ıe prices were at Chicago, St. Louis, or anywhere else.
sonville people were trying to sell f. o. b. and trying to
rom the consignment business. They had a lot of buyers
ville, and the thing they wanted to know was what the

...ents. We are acting here for growers, ...
...ents."

That is the attitude we are up against. Th...
tions is not any more to blame handled by the ...
man at the other end.

...the other end, these people at Jacksonville ...
...ed that the people at Crystal Springs w...
...r and that we were shipping. I came ba...
...self, in my way from the cantaloupe ...
...visited our Jacksonville representative. I ...
...we went over the situation thoroughly ...
...ed from there over the information we ...
...Crystal Springs. I had this other man go over ...
...ve at Crystal Springs. He found him go...
...getting the actual facts. He went right to th...
...shipping what they were getting. Cryst...
...from Jacksonville and there was a reas...
...distribution, for one thing.

...respect we may say that the f. o. b. se...
...what it is supposed to accomplish. ...
...good distribution just so far as you have a ...
...t. But if you have a lar...
...the control of the shippers, distribution c...
...more effectively.

Mr. HUTCHINSON. But if you had a cooperative ...
...cantaloupe districts of the country, they wo...
...they not?

Mr. SHERMAN. Theoretically, if you combin...
...and have all their business handled t...
...they would do it. But I think we may sa...
...that there is a physical and economic impo...
...of cantaloupe growers which will i...

LGESEN. I would not imagine they would form that way. hink, if they formed those districts that come on to the actically at the same time—and that varies a great deal— d have separate organizations for the different districts about the same time.

ERMAN. That is my idea of the way cooperative organ- marketing is to be worked out. We may have a number of ons shipping at the same time to naturally the same nd through our news agency the associations in different ie country will be able to so handle their own distribution will not unnecessarily interfere with each other.

ELE. You would also be encouraging a trust, would you

AIRMAN. That is excepted under the new trust law.

RMAN. Can you imagine the possibility of forming a trust ble products that rot the day after to-morrow? There is sential that I want to emphasize. We can not handle this n simply by having a number of men in the markets and of men in the producing sections. We must have some of in Washington, and you must not ask us to handle the n work with clerks at salaries of $900 to $1,000. We must in Washington who know something about these products. have men in Washington who know something about the who know the locations of the lines of western roads and rn roads the minute they hear those names. They must be ailroad men so far as knowledge of the territory served by in the country is concerned. They must also know some- t the markets. They have got to be able, eventually, to get wo or three days here in Washington a general news release rement of each of these important crops which will be so and so valuable that the Associated Press and the United be glad to run it. When we can cover enough of the eresting things to make it worth while, we can get pub-

ebody raised the question—I believe Mr. Steele raised it— proportion of this money spent in Washington and out of n. The proportion of this $136,600 that is spent outside gton will be very large, but there will be a certain perma- in Washington, which will be rather large, and it will at least three persons for every crop handled telegraphi- physical conditions under which these things are to be the morning, with reports coming in for 10 different ill require us to have approximately 40 people on duty at inute to take care of that information.

IRMAN. You have got to pay high salaries to these men.

RMAN. We have got to have some men in Washington who ness—men who know something about the markets in the tes.

had very little trouble with respect to the personnel. on the committee raised the question the other day about ice rendered by the Civil Service Commission. I might served seven years on the examining board handling agri- aminations very largely, and the rules of the commission

are sure that they never require you to take [illegible]
in such a matter as getting suitable clerks for those [illegible]
where we want our man to know what the market [illegible]
of going out and ascertaining the market prices. I [illegible]
taken the matter up with the Civil Service Commission, [illegible]
many who are struggling for a special examination at [illegible]
in which we will make it a prerequisite that [illegible]
the knowledge of stenography and typewriting, with [illegible]
being able to pass an examination in that, and that [illegible]
a man's experience in this line of work. Then, taking that [illegible]
up, we will give him a set of practical questions covering market [illegible]
that will bring out his knowledge of fruits and [illegible]
[illegible] the classification of the different [illegible]
show that he was a good clerical worker. They will [illegible]
mathematical questions to test the kind of clerks [illegible]
And I was delighted to see the letter that has been [illegible]
men for this work. I would not for one moment [illegible]
assistance that the Civil Service Commission can render [illegible]
in the way of examinations. It has been absolutely helpful [illegible]
examinations.

The CHAIRMAN. Doctor, have you figured out in your mind [illegible]
the ultimate annual cost of such a system as you have [illegible]
during peak?

Mr. SHERMAN. So far as it applies to fruits and vegetables?

The CHAIRMAN. I mean this item here.

Mr. SHERMAN. We say that that report is going to be [illegible]
in the matching of these markets. The greater part of the [illegible]
will go into salaries. The telegraphing is a big item. [illegible]
the greater part of this appropriation will necessarily go into [illegible]
and traveling expenses.

As I said, with a greater number of markets to ascertain [illegible]
[illegible] the traveling expenses. We found last summer [illegible]
men stationed in St. Louis served very well [illegible]
[illegible] in and down into Texas. He had a [illegible]
automobile and other equipment in St. Louis. We, of course, [illegible]
[illegible] market information, and he digests [illegible]
[illegible] the various shipping associations in Arkansas, [illegible]
[illegible] the telegraphic [illegible] only from St. Louis, [illegible]
[illegible] Of course, we can go that far [illegible]
[illegible] Government expense to the nearest point [illegible]
[illegible]

[illegible] markets where we have not [illegible]
[illegible] letters for this purpose [illegible]
[illegible] The St. Louis & [illegible]
Missouri, Missouri, Kansas & Texas, and the Frisco [illegible]
[illegible] of St. Louis. The [illegible]
[illegible] get this information [illegible]
[illegible] we had over one hundred letters [illegible]
[illegible] As Mr. Helgesen suggested, when [illegible]
[illegible] The [illegible] letters during the [illegible]
[illegible] telegrams a day giving [illegible]

iations and people who wanted information just as quickly uld get it, because of moving shipments by it.

IAIRMAN. It would be almost impossible for you to give like an accurate statement as to how much this service t, because, I take it, as you develop the service you are iave expenses that you do not foresee and to incur expenses an not anticipate now.

s point informal discussion took place.)

LGESEN. It seems to me the greatest benefit from this work from dealing through associations. Is there any reason why iations should not pay for their own telegrams?

IRMAN. They have to pay for their own telegrams.

LGESEN. I mean from Washington.

IRMAN. We had people in California who did pay for those all summer during the peach season, paying transconti-s.

ND. Transcontinental tolls cost $1 for ten words.

AIRMAN. Give us a brief statement of telegrams paid for not paid for.

IRMAN. We pay for every telegram coming to Washington r source and for every telegram which we send to our men l or market. Then every one of our men distributes that n, but that distribution is at the expense of the recipient.

AIRMAN. You say that you pay for every telegram coming ington?

RMAN. Yes, sir.

AIRMAN. You mean every telegram coming from your ppose I represented an association of tomato growers of olina, having no connection with the department at all, and d you, the telegram costing a dollar; you would not pay it?

ND. That would be a paid message.

AIRMAN. But if I were an agent of the department and would pay it?

RMAN. We pay for every telegram asked for.

VELL. You pay for information you get from the rail-

RMAN. Absolutely. We had this difficulty last year with o railroad information: A great many railroad companies e shy, and the important officers wanted to keep the thing vn departments, especially the agricultural departments, a great pride in their organization, and some of them try narketing of their own. They wanted all telegrams to come d office, and then they would give us a once-a-day wire. The hat they would get these telegrams in and then start a wire o'clock in the morning—when the important official reached instead of the night before. That made the service too iade it impossible for us to get a complete picture of the out by 9 o'clock in the morning. So, this year we are r planning to increase the number of wires from rail-king them that they require every division superintendent o us the movement on his part of the line, because he has iation that night and he can send it to us at night; and, if ers from the general superintendent to send us that in-

formation as a night message, we
general superintendent agrees to
and, of course, this is a service of
This is the service we promise
him. He wanted to know just w
was so valuable and who is gettin
this is a truly valuable service,
will wire us before midnight just
where they were going. That gi
trade that they have never had.
merchants of a certain town kn
within the next 12 or 24 hours, b
A man was in my office a few d
business down at Laredo and f
this news service this spring and
that movement. He explained th
possibility of organizing a cooper
movement out of that district h
largest shippers have had a prett
got it by carrying our hand be
railroad official." That is the w
tained. This is the first effort to
out and set it before the public, a
Do you want a little detailed
people and what have been some
The CHAIRMAN. Give us the a
Mr. BRAND. A few specific ca
Mr. HAUGEN. Before you get
is of value, but I fail to see that
special credit. They are furnish
notwithstanding the fact that the
I am talking about information
stock. In that branch they give i
The CHAIRMAN. Do you pay f
Mr. SHERMAN. We do not pay
Mr. HAUGEN. You pay for th
other messages free; that is the o
is due the railroads for furnishin
Mr. SHERMAN. Possibly not. b
comfortable situation without th
unable to stir a wheel if they dec
Mr. HAUGEN. The railroad co
the farmers; they get the benefi
Mr. SHERMAN. To a certain e
we have been telling them.
Mr. HAUGEN. It is an absolute
ucts and they get the benefit of i
Mr. SHERMAN. Of course, in ce
way. In certain cases it results
haul instead of a long haul. It is
Last year when we undertook
berry crop we had no organizati
way, and Mr. Schleussner, who i
20 of the larger markets and m

handler in each city to give us a morning wire on the ices prevailing in that market for strawberries and as near d the number of cars on the market. The larger dealers many cars are being unloaded on the market at the hour are selling.

ose arrangements made, Mr. Schleussner went to Hammond, nter of this strawberry district which has grown up here line of the Illinois Central, largely in the cut-over pine re they have a series of little local cooperative associations. done a lot of colonizing work. First is an Italian colony, rman colony, and next a Hungarian colony, and then an colony, and, I think, a Swedish colony; as a matter of are several Italian colonies. Each one of these little colo- anzied into a cooperative association to handle the straw-, which is one of the important crops. They had ex- wo bad years. I may be wrong but my recollection is that h the two preceding seasons the Chicago market had been

trict originally began with an f. o. b. shipping point ar- When those people went into the strawberry business e nicest packing in the United States; they had the fanciest sale obtainable anywhere. The Illinois Central developed ss with Chicago. Everything went straight to Chicago. stern buyers got onto the fact that those strawberries were les and that they were better packed than Floridas. So n Pittsburgh, Buffalo, and other large cities began coming is territory, and there began to be competition here for es.

GESEN. Let me suggest that the names of these locations record. When you say "down here" and "over there," ningless.

MAN. At the same time this business here increased and —

ESEN. There you go again. You should say "this Louisi- s."

MAN. As that Louisiana business increased and outgrew l of the buyers on the spot, the consignment was very o Chicago. A situation developed which made it com- easy to measure the capacity of Chicago, and after break- he Chicago market repeatedly it came to be pretty gen- rstood in Louisiana that anything more than 20 cars a day icago market meant disaster and a breaking down of nen the Chicago market broke down, the f. o. b. prices at went down correspondingly. People who were getting e returns from Chicago were forced to sell f. o. b. for ney could get.

told when we went into that territory that, unless better secured last year than had been secured during the two easons, it probably meant practically the ruining of that nd it was a very serious proposition that those people y were heavily in debt for fertilizer and all that sort of had not been able to cover advances of previous years m.

conducted by the Office of Markets and Rural Organization during
ion:

f Steinacher, German Farmers' Association, Ponchatoula, La.,
:

l to the Government service on crops in this section, we wish to
s service has aided in every way in the better distribution of the
tain a record of the cars sent out every day has been impossible
r, when obtained from your service.
l to put a cash value upon the service, but we would state that it
luable to us.
that it will be made a permanent feature, we are."

. Villadsen, secretary-manager, Thorsby Fruit & Truck Growers'
Thorsby, Ala., April 28, 1915:
in behalf of our growers, as well as myself, that we appreciate
We have only made a few express shipments (of strawberries),
ng the market conditions all over the country by your reports we
get $4 per crate here for northern shipments."

Villadsen, July 17, 1915:
d before and will say now that this service is most valuable to all
erishable products. We have something to be guided by now in
stuff; before we were in the dark. The system you have adopted
se, be improved and extended. I sincerely hope it will be con-
saying this I am sure I am voicing all our growers of perishable
association."

in, Coulee City, Wash., September 24, 1915:
ce has been a real help to us in the fruit business, because it has
mprehensive survey of the actual market prices being received
of fruit from a source the accuracy of which could not be ques-

bled us to decide where the best outlets were and given us an
of what our fruit was worth at the shipping point, something it
ult to determine in times past.
has been worth to us much more than the cost to the Govern-
rtainly hope that it will be continued and that I may remain on
ist next year."

la, secretary, Independence Farmers' Association, Independence,
915:
wberry season is about to wind up, we wish to respectfully ex-
ur satisfaction for the laudable work conducted by the Office of
rnishing our association with daily reports on the strawberry
quotations in the principal markets and shipping points of the

und said reports not only highly efficient, but also true and cor-
his most important feature—the trueness and correctness, which
e found elsewhere—which causes us to address you, and beg
at the said service be continued in the years to come, as it proves
t to farmers' interests."

. Roark, business manager, Anderson Fruit Growers' Association,
July 22, 1915:
touch with the situation through your reports we were able to
e, and to make it 10 cents higher than any other point reported

g statements have been extracted from typical letters received
ent of Agriculture from dealers, distributors, and transportation

ns Co. (per J. P. Fox), Hammond, La., May 15, 1915:
ution has been more even than in other seasons for the associa-
rs have been thoroughly cognizant of conditions in the principal
stances this year I feel that sometimes serious overloading of
ts has been avoided. In this manner it is certain that prices
g end have been more equable.

ry proposition, I feel that the service that your department has
es reached thousands of dollars in a single week. I feel that

this service is a thing that one can not value in dollars and cents, but wish to go on record as asking that you continue it every season hereafter

From Peter P. Hovley, mayor, Brawley, Cal., July 12, 1915:

"I wish to convey to you the appreciation of the citizens and business of Brawley for the assistance your office has extended to the cantaloupe pers of the Imperial Valley in distributing this season's crop."

From Ginocchio-Jones Fruit Co., Kansas City, Mo., July 10, 1915:

"We can say unreservedly that the efforts of the bureau to furnish information has been a success. We have heard a complaint from certain of operators, such as brokers at shipping points, that the dissemination o vices of the market value of products at shipping points has prevented brokers or speculators from making any money, which is rather a view of your putting an end to some questionable practices on the part of brokers in overcharging their clients, who were ignorant of the daily mar

From Mutual Orange Distributors, Redlands, Cal., July 17, 1915:

"This was an unusually difficult season in the cantaloupe business on of the cold and rainy weather east, and had it not been for the splendid tribution which we had, I am positive it would have meant heavy losses to the growers and shippers; but by properly distributing the shi every day it was possible to give each market just about its requirements, the result that these cantaloupes were billed direct to the various markets sold without any accumulation, and, on the other hand, the consumer fresh cantaloupes arriving daily, without any stale goods being placed on market."

From C. L. Campbell, chief traveling agent, American Express Co., Hamm La., May 21, 1915:

"We wish to congratulate you on the splendid work done by your depar in the Louisiana berry district this season.

"The information which has been so promptly and effectively dissemi throughout the entire district is thoroughly reliable and has enabled the pers to place the cars of berries profitably, resulting in thousands of do going to the berry growers, which they have never known before.

"In behalf of the growers and shippers we wish to thank you for the work and hope it will be continued next season."

From U. Grant Border, president, T. H. Evans & Co., 218 Light St Baltimore, Md., September 28, 1915:

"In this connection I wish to assure you that I have never had anythi come to me of this character that proved so helpful as have these reports fact, I believe that when all the shippers and receivers consult these re many over-burdened markets and heavy losses will be averted.

"I do not know of anything your department has undertaken to com with this work in value to shippers, dealers, and consumers."

Mr. SHERMAN. I may say that, while the buyers on the ground garded this movement with a little hostility at first, before the of the season they were all of them on tiptoe for this informat and, somewhat to our surprise, we have a number of very appre tive letters from the buyers, hoping that this service will be c tinued; and the buyers were asking us before we left that territ "Won't you move your man up from Hammond to Humboldt Chattanooga territory and give us this same sort of information?

The manager of the association here at Thorsby, Ala., had s one of his men into the northern markets to keep him poste prices. He paid for our telegrams from Washington for a wee ten days during the height of the movement and wrote to us other day that he wanted to know if he could count on the ser again. He said the information received from our office was so m more comprehensive and so much more reliable than that supplied his own representatives in the markets that he proposed to keep t representative at home and pay for the telegrams from Washingto we would render the service.

ustrates the possibilities of saving duplication of effort by
ions.
se, if this little association at Thorsby, handling a few cars
, puts itself to the expense of maintaining a man in Chi-
other little association at Cullman will very likely put its
hicago. Chicago is one of the largest markets for each one
of these associations, and there may be a dozen men rep-
growers' associations selling their products competitively
narkets and not one of the associations getting a service
e to it as the service we can render all of them.
LGESEN. That carries out my suggestion that when you get
rly organized it will be so valuable that those associations
d to relieve you of practically all the telegraphic expense if
rnish the desired information.
ERMAN. I think that is fair to assume. We will always of
ave to send this information to our own men in the markets.
ave to furnish St. Louis, Cincinnati, Chicago, the Twin
New York with this information just as quickly as we can
from Washington. Our men in the large markets must be
y the trade and by the producers in their territory as the
's of this information; because, if they are not, they can not
rs of the information.
GESEN. Eventually enough associations will be formed so
will be glad enough to have a man who can send infor-

RMAN. We can not get along without our men at the mar-
e associations will undoubtedly pay for the cost of these
'rom the nearest point at which we have a representative.
IRMAN. Your story is so entrancingly interesting that we
all the afternoon.
it give the committee, in your judgment, a fairly good
work?
RMAN. It does not give the committee a complete picture
did last summer, but all I want to do is to call attention
that, if this work is to go on as planned, and if the
is likely to approve this item, it will involve the expendi-
od deal of money, out of the small reserve Mr. Brand has,
w and the 1st of July, so as to permit us to carry on
up to July before this money is available. For that
ve been anxious that the committee should question me so
l get a very definite line on the thought of the committee,
at we may know how to go ahead in selecting new men,
ust do immediately if we are going to build up the service
ortions this item contemplates.
IRMAN. I would like to ask one question for the informa-
committee: What increase in this appropriation do you
er what you are spending this fiscal year?
MAN. As I said, it is very hard for us to say just how
into this, because the transportation section put a large
nergy into it. Out of the allotment made for the market
uppose not more than $30,000 went into this work.

ENT OF MR. FRED TAYLOR, COTTON TECHNOLOGIST, FICE OF MARKETS AND RURAL ORGANIZATION.

AIRMAN. Mr. Brand, take up item 41 and tell us about that

ND. Mr. Chairman, the next item is No. 41, for the investi-
l demonstration of cotton standards and cotton testing.
item we are asking for a slight lump-fund decrease, though
esult, due to the transfer of certain salaries, makes a small
f $6,100. The work in cotton handling has been described.
is distinct from the work under this item in large part,
e same force, upon occasion, is shifted, as I explained yes-
m project to project. I am going to ask the leader of that
present it, and as the increase is so small I hope that he can
the actual lines of work that are being conducted very
order that the committee may ask any questions it desires
ecific line of work.

AIRMAN. Before he does that, Dr. Brand, I would like you
tiate just as briefly as you can the item put down under 41
m under the Bureau of Plant Industry—under Dr. Cobb.

ND. I do not know that Dr. Cobb is doing any work of this

AIRMAN. You say, then, that he is not doing any work of
ter?

ND. So far as I am aware, he is not doing any work of
ter. I will ask Mr. Taylor, the project leader, to discuss

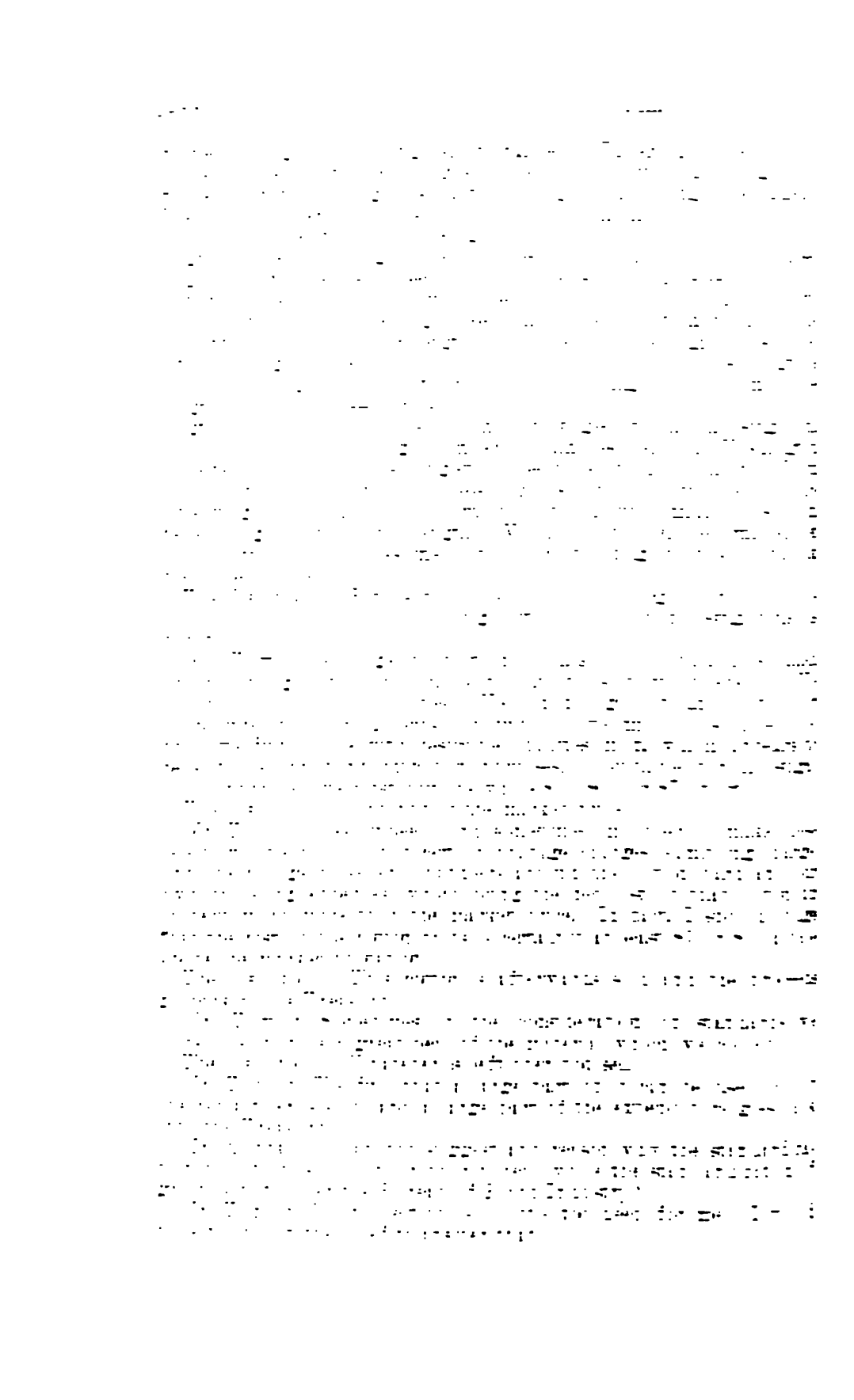
LOR. Mr. Chairman, under this project we have been con-
vestigations relative to the development of standards for
ost people think that when we say standards for cotton
an standards for grade, but under this item we are study-
ly grade but also color, length, perished staple, immature
l all the other varying qualities and characteristics of
; we hope eventually to standardize.

ıs of the investigations under this project we have been
sist in the development of the present white standards
now in use. They comprise, as you know, 9 full grades,
iddling fair, strict good middling, good middling, strict
middling, strict low middling, low middling, strict good
ınd good ordinary. The distribution of these standards
ted since the 15th of December, 1914, under the provisions
ın-futures act.

the official cotton standards for color have been promul-
ıder this classification we have 11 new standards, in addi-
9 white standards. The standards for color are divided
different classes—yellow tinged, yellow stained, and blue

ellow tinged standards for color we have 5 grade boxes,
Low middling yellow tinged, strict low middling yellow
ldling yellow tinged, strict middling yellow tinged, and
ling yellow tinged.

ıe classification "yellow stained" cotton we have three
ollows: Middling yellow stained, strict middling yellow



RAND. Mr. Chairman, the cotton-standardization work is esent location because this committee transferred the item arge. I think that is the answer to that.
DERSON. That is an answer; but what I was trying to get at her the gentleman knew of any other reason.
YLOR. I would not like to venture a personal opinion.
AND. The historical reason is that the work was started in au of Plant Industry many years ago and was handled by au for years before this office was started.
DERSON. You do not mean to give the committee the impres- no work was done on cotton standards until your bureau ed in the department?
YLOR. It is a continuation of work previously started in the f Plant Industry.
DERSON. That is the exact situation with respect to grain.
AIRMAN. I do not know any reason except that the com- l just do it, which is a pretty good reason.
YLOR. In addition to our work on what is called the regular cotton crop, we have made some investigations and demon- which we hope will eventually lead to the development of d for the Arizona Egyptian cotton, which I presume has his committee's attention previously and which needs no scription, except to say that in Arizona they have a peculiar leveloped culturally almost exclusively by Government ex- iere is now a commercial production of Arizona Egyptian ith absolutely no American standard by which its quality dged, and we are conducting investigations in the South- the hope that perhaps in another year or so we will have sufficient data and material so that we can present to the owers in Arizona a standard for their Egyptian cotton.
AIRMAN. Have you standards for Sea Island cotton?
YLOR. No.
AIRMAN. Are you investigating that, too?
YLOR. In connection with the development of a standard staple cotton we are also collecting samples from the Sea rkets. We are also getting from those immediate markets important dealers their interpretations of the various d we expect very shortly to begin the classification of these l types and see whether we can not develop something in the standard. There is no definite standard now for the Sea ton. The most important growers are shipping out under private marks, without any attempt to develop a standard hipments.
neral way, this covers the activities under investigations nstrations.
AIRMAN. You are doing some work also in testing the sile strength, and bleaching qualities of different classes But that comes under the general idea you have dis-

YLOR. I have not mentioned that particular project yet. the project for testing the waste, tensile strength, and qualities of the different grades and classes of cotton, we it to be part of the investigation and demonstration of

RAND. It is worth about 188 points under white middling at ment.
AYLOR. One hundred and eleven.
RAND. One hundred and eleven is the average.
HAIRMAN. $5.50 a bale?
RAND. Yes. These standards are just out and are about to be ed. We already have a number of orders for them.
AYLOR. That explains why it will be necessary to make ad- spinning tests and also further investigations in the field ine the relative values of colored cotton as compared with tton.
HAIRMAN. I was thinking, however, Mr. Taylor, as you had ly completed your investigation with reference to white cot- your expenditures in that direction would be comparatively and that the money which you had been using heretofore used for other purposes.
AYLOR. Yes. That is the intention.
RAND. Yes.
HAIRMAN. Then, why have you asked for this $6,000?
AND. In the first place, we have two grades to test through- standards as against 9.
AYLOR. Our investigation with reference to perished staple dards for length will have to be made in order to fulfill the the trade. So that we are not near the end but just get- the beginning on the standardization work.
HAIRMAN. I had been hoping that on this item you would oint where you would begin to stand still.
AND. I think that is in a measure true, Mr. Chairman. Our n this matter is perhaps a little different from others. You d it is our aim to give the trade just as quickly as possible, as thorough investigation as we can in a given time, a that we begin to use. Then, we carry on reinvestigations of dard and change the standard rather than deny the trade f it in the interim.
IAIRMAN. I am thoroughly in accord with that idea, too.
l now recess until 10 o'clock to-morrow morning.
upon, at 6 o'clock p. m., the committee recessed, to meet w, February 12, at 10 o'clock a. m.)

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Saturday, February 12, 1916.

mmittee met at 10 o'clock a. m., Hon. Asbury F. Lever n) presiding.

NT OF MR. C. W. THOMPSON, SPECIALIST IN RURAL IZATION, OFFICE OF MARKETS AND RURAL ORGANIZA-

IAIRMAN. Mr. Brand will now take up item 42, on coopera- l credits, etc., with an increased estimate of $6,360.
AND. Mr. Chairman, this is the item under which we carry igations and a certain amount of demonstration work

mortgage loans in any given State. As a

two days was occupied in the presentation

tained in the testimony to which Dr.

luable to those of us who are interested in rural-credits
n (and I know we all are more or less), and I commend
: careful reading and consideration.
Doctor, if you can do so very briefly for the benefit of the
e here this morning, will you tell us what conclusions you
:hed from these studies—what general principles you have
ıning through the whole of your studies.
IOMPSON. Yes, sir; I shall do so. As regards costs, a glance
art will show that there is a wide variation as between the
ıd, if you have the table of the subdivisions before you, you
:here is likewise a wide variation in costs as between the
parts of a State, oftentimes.
IAIRMAN. By cost you mean——
IOMPSON (interposing). I mean what the farmer pays for

IAIRMAN. Interest?
OMPSON. And commissions and other charges.
BEY. Annual commission—what do you mean by that?
OMPSON. The annual commission, as shown, is annual com-
ıarged as such—that is, where commission is charged along-
:st—or, if it is advance commission, it is reduced to an an-
ı, so that the figures represent annual figures comparable
nterest rate.
:ELE. I should like you to take up Iowa and analyze that

u have there three lines—one blue, one red, and one brown.
the blue, and you will——
OMPSON (interposing). That is another chart. I shall be
te up Iowa if you wish.
AIRMAN. Take up Iowa, and that will be illustrative of the
position.
ELE. Explain that line there [indicating]—insurance com-

)MPSON. You refer to the sources of loans?
ELE. Yes.
)MPSON. The chart shows that the total estimated farm
lebt of Iowa is about $450,000,000, out of which one-third
al, or $150,000,000, is supplied by insurance companies.
: blue line.
:LE. That is the blue line on top?
)MPSON. Yes, sir; and about $100,000,000 comes from the
ch is the red line.
ELE. Take up insurance companies. What rate does that

)MPSON. The lines indicate the quantities or amounts of
:e rate question is entirely apart from this and represents
: for States, or for subdivisions within States.
:LE. Now, what I am trying to get at is this: You have
ıct lines here. The insurance companies are the men who
on lands at, say, 50 per cent of their appraised value.
ıem at a lower rate. Is that the analysis?
MPSON. The insurance companies ordinarily select the bet-
risks in farm loans.

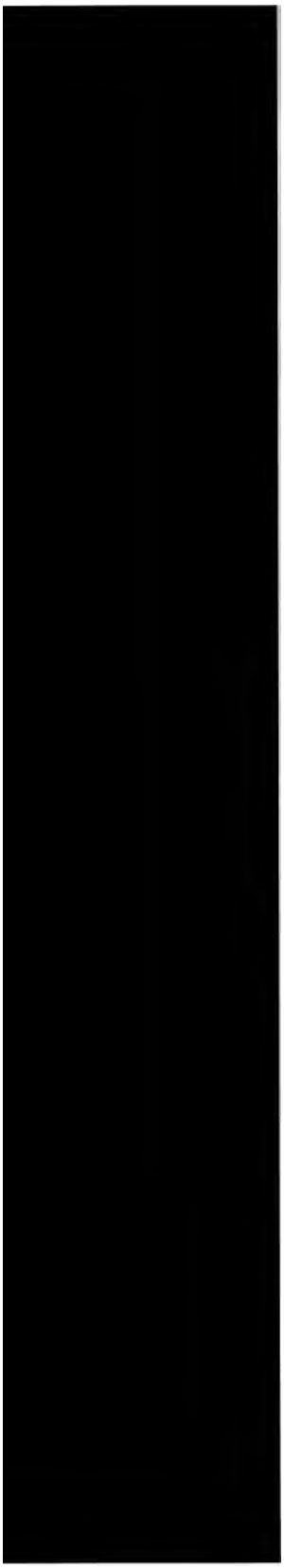
[illegible] Laughter. Now, I [illegible]
[illegible] I [illegible] from [illegible]
[illegible] from the [illegible] I [illegible]
[illegible] where you are selling land [illegible]
[illegible] getting large payments down. That net interest would be about 6 per cent.

BEY. You call that private funds?
OMPSON. Yes, sir.
AIRMAN. Suppose we let Dr. Thompson tell us about this.
OMPSON. Among the sources of loans are, of course, private
where private individuals loan to their neighbors, or where
ing land takes a large share of it in the shape of a mort-
at a certain rate of interest. That would be one of a
ber of sources that have been considered, but when it
he actual amount of loans that are secured, say, from pri-
iduals, we have not been able so far to calculate the rela-
t of such loans as compared with the total. The only way
m an opinion as to that part of the total is by a process
tion. We take out the insurance loans, the bank loans,
other loans as we could get at, and we know, then, that
must come from private individuals.
GESEN. In regard to bank loans, do you mean mortgage

MPSON. We are discussing mortgage loans now.
GESEN. In my country almost the entire amount of loans
anks comes from private individuals. The bank may
day, but it keeps turning all the time.
MPSON. The figures given here, however, for bank loans
he loans that banks have outstanding from their own
do not represent the loans which the banks may make as
re they may handle the money of private lenders, insur-
nies, savings banks, etc.
EY. You can pick up the bank statement at any time and
w much in real estate loans they have in the bank.
MPSON. We have made a distinction between the loans
anks from their own funds and loans made where the
gents for others. Those are tabulated separately.
IRMAN. Doctor, proceed in your own way to tell us what
you have reached from these studies, possibly as to the
erest in the various States, the amounts of commissions
the various sections of the country, and whether these
and charges should vary, and what underlying funda-
ors there are that enter into those things. I think that
ething the committee will be most interested in.
IPSON. I think a glance at the tables or figures which are
committee will show that in the case of farm-mortgage
ates vary from 5½ per cent up in the New England
over 10 per cent in the South and in the Rocky Mountain
he tables show what part of those averages is interest
rt is commissions. One conclusion is that both commis-
erest rates are lowest in the older and more highly de-
icultural sections of the country and that both commis-
terest rates are higher in the relatively less developed
regions of the South and the West.
.Y. That condition would be naturally expected, would

PSON. It would be as one proceeds with an analysis of

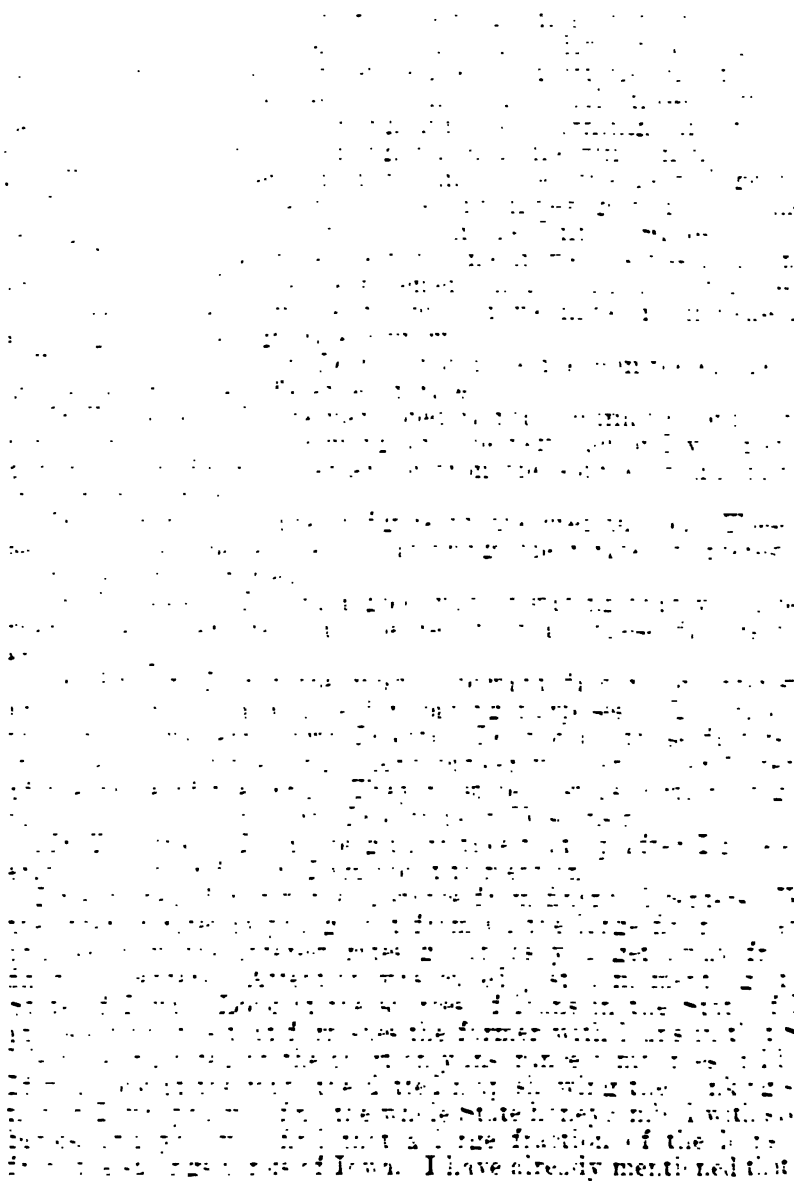
LL. Do you think the rates are too high?



also of Alabama, Florida, Arkansas, and Montana. It
te so true of South Carolina and Georgia. What factors,
ıental factors, enter into the making of these higher rates?
OMPSON. I should like to say, Mr. Chairman, that I would
select one State at a time of the States you mention.
AIRMAN. Suppose you take two.
LGESEN. Take North Dakota.
OMPSON. As far as North Dakota is concerned, I would
ttention to the variations within the State. I have before
erages for interest and commission rates for different dis-
ıin North Dakota. We divide that State, as we have all
into nine districts. To give you a picture, take this chart,
top, beginning on the west end, number eastward 1, 2, 3;
nter districts, 4, 5, 6; and at the bottom, 7, 8 9—9 being
heastern corner of the State. Let me give you the figures
tricts of North Dakota to show the wide variations within

a:	Interest plus commission.
1	9.0
2	8.6
3	7.6
4	10.1
5	8.2
6	7.4
7	10.1
8	9.6
9	7.7

notice that the highest rates are found in the districts
st (Nos. 1, 4, and 7), and the lowest figures in the Red
y (districts Nos. 3, 6, and 9).
ESEN. Do your figures include commissions?
MPSON. Yes, sir.
ESEN. I notice the commission is among the highest in the
tes—approximately 2 per cent.
MPSON. Yes.
GESEN. As I recall the relative degree of settlement in
ota, this rate corresponds in some degree at least with the
in the locality. In other words, the more thickly settled
ve the lowest interest rates. Now, what conclusion do
om the increase that you have just stated?
RMAN. That is one factor entering into it. Now, give us
ctors.
PSON. You would have to begin with certain fundamental
litions—rainfall, to begin with. As you proceed westward
d River, the rainfall becomes less and less, and you will
perceptible correlation between the rainfall and the rate
Closely connected with rainfall would be certain natural
t winds, for instance, or other conditions of that kind.
ESEN. Then, of course, there is the character of the coun-
estern part of North Dakota, for instance, is a broken
try, with less good land for farming than there is in the
very acre is tilled.
PSON. I was going to mention next what has been sug
e Congressman, namely, soil conditions, which, in turn



Iowa. I have already mentioned that

Well, you take, for instance, North Dakota

of farm loans; you have got about eighty or eig

carried by the insurance companies.

Mr. SCHEIE. Forty-five millions.

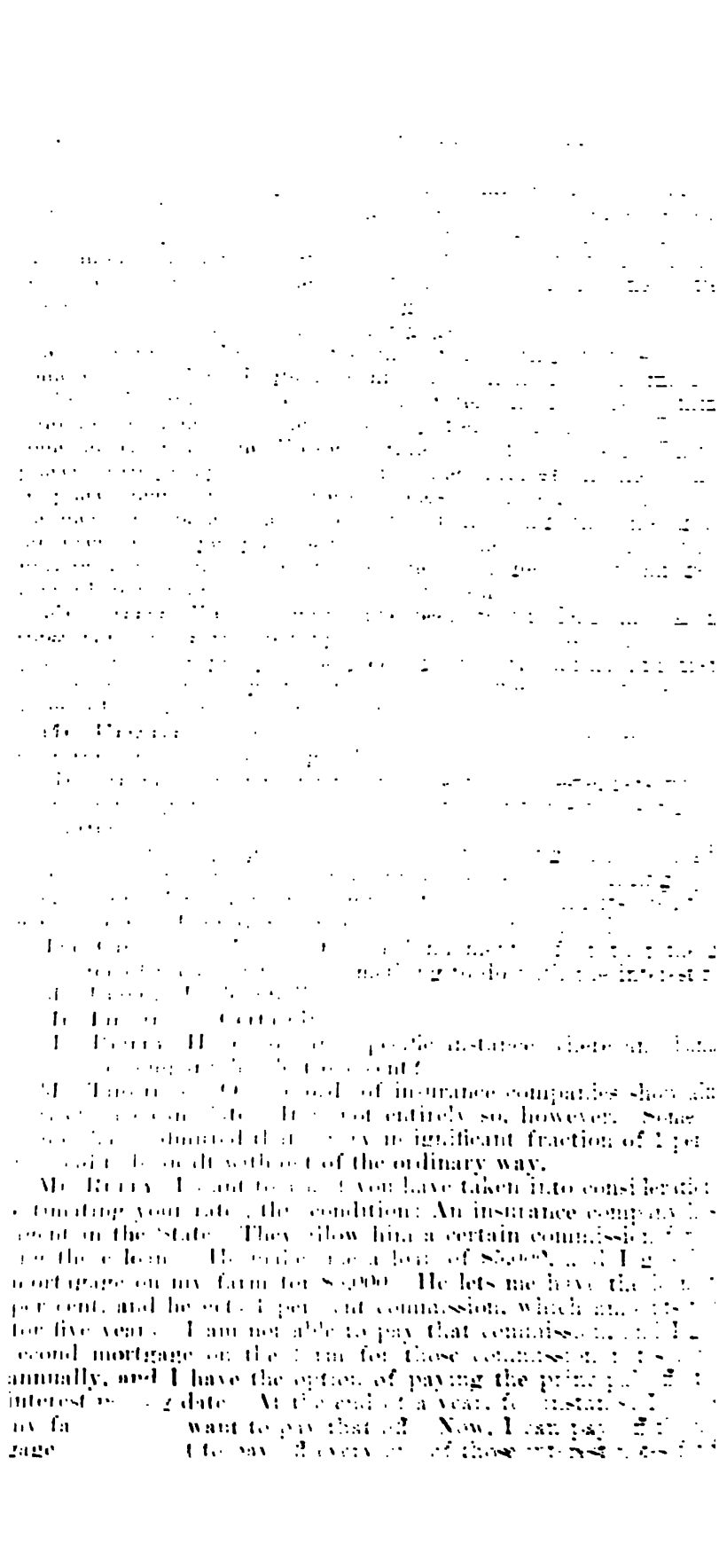
Mr. THOMSEN. About twenty millions.

Mr. HELGESEN. About twenty millions carried by the insur
companies and five millions by the banks. Who carries the bala

HOMPSON. Either mortgage companies or private lenders, ge part of the mortgage companies or loaning agents get ıey from their loan connections.
:ILLY. In our section there are local people lending money ıkotas or other outside States. A man will start a loaning ıd get the money and lend it back to the settlers. It is in of private individuals.
IOMPSON. Wisconsin affords a very interesting illustration ; which, in large part, supplies its loans from local capital, :xplains why it is when you come back to commissions that ge commissions in the State of Wisconsin run relatively ice versa when you turn to some States like North Dakota, and Oklahoma, where you find that they charge high ns. You will also be interested in knowing that a very tion of the total farm loans in such States come from the

AIRMAN. It is a fact in well-settled, old-settled communi- financial centers and near the sources of money, that the ıe farm loan is so well known that that greatly affects the erest?
)MPSON. Undoubtedly.
AIRMAN. What I am trying to bring out is whether or not ty of the asset has anything to do with the rate of interest.
)MPSON. It has.
AIRMAN. So, if any system can be devised whereby you reater liquidity to the security, the necessary consequence falling of the rate of interest on that kind of security. roper deduction?
)MPSON. Yes, sir; I think it is.
GESEN. That is an interesting thing, but how far back have with your investigations?
MPSON. These data represent existing conditions as recent d bring them together.
GESEN. As far as State loans are concerned in North Da- not know of any losses. If there are any, they are ex- all.
MPSON. Very few.
GESEN. I do not know where in the United States the se- fer, and yet the interest rates are higher.
MPSON. The answer which I made a while ago is that relation apparently between the actual losses and the e.
ERSON. It seems to me when you put the proposition on land values that you overlook, to some extent at least, ı of uniform and continuous earning capacity of the land. ıp in North Dakota you may get a crop one year and the ou may not.
ESEN. Since when? In what sections?
ERSON. In sections there for a good while.
ESEN. Not to my knowledge, and I have been there 30

ERSON. Oh, I am not asking you to admit it, but it is a same.



vance for the five years. That will necessarily, when con-
connection with the rate of interest, raise the rate of inter-
actually pay on that farm. Have you taken that into con-
in fixing these rates?

MPSON. Yes, sir. We have put that information on one of
which are here on the table. You will see a comparison
erent commission methods and the relative importance of
nethods in different States. We have compared the no-
n method with the advance-commission method and with
ment-commission method.

LE. The proposition that Mr. Rubey made there was, did
ine that the agent guaranteed to the insurance company
nt of $5,000. Have you determined that feature of it?

MPSON. I do not know that I understand the question.

LE. The proposition he made is, did you find out whether
uaranteed the payment of $5,000?

MPSON. Yes, sir. We have information to that effect.

EY. It is very rare that they do that. You will find that
ls employed generally by the large insurance companies
it from the methods employed by the smaller insurance
because the large insurance companies have their own
tment and rarely run their own mortgage-loan banks.
r companies go out into the market and buy their own

LE. I know that the agent in my town who turns in such
sales is required to guarantee it. He guarantees it, and
rantee is the additional rate of interest.

MPSON. The larger insurance companies each have their
epartments and have agents located in the leading loan
hey have connected themselves up with local correspond-
its, and for that purpose they appoint a bank, most often
, which receives applications, and the bank deals with the
ct and sends the applications to the company. Generally
it the insurance companies hold their local agents re-
ithin a limited period of time for the mortgages, until
ally accepted by the insurance company. Every large
mpany has its own appraisers who go over the field and
very individual mortgage before they finally accept it.
mination of the individual plot of land by the appraiser
ance company, they hold their local agent responsible,
find that the security is not up to the standard they turn
e local agent.

RMAN. Let me ask this question, as bearing on the funda-
his proposition: Would the question of the permanency
in cases of investment, from the standpoint of the in-
anything to do with the rate of interest? Would the
ne cut any figure in the rate of interest that the investor
of security had?

PSON. Undoubtedly.

RMAN. Do you draw this conclusion, that the longer the
vestment, relatively, the lower the rate of interest?

PSON. We know that the investor will accept a lower
vestment if he knows it will run undisturbed for a long

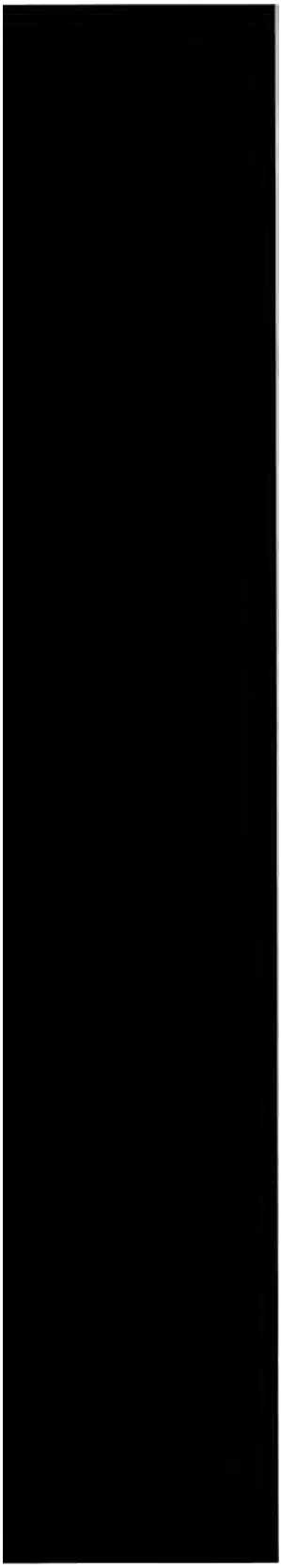
IAIRMAN. Could you give that in percentage, varying from per cent to a certain per cent in different sections of the

LGESEN. That is not run on a percentage basis.
IAIRMAN. I know it isn't, but I thought maybe he had cal-

OMPSON. In the light of the large variation, it is not deemed lculate it in percentages.
AIRMAN. Then, you say that the cost of this abstract of title m $10 to $150 or more?
OMPSON. Yes, sir.
AIRMAN. What, then, would you say would be the average total cost—upon farm mortgages in this country? You 5 per cent to 10 per cent in interest rates; you have from it to 2 per cent in commissions; you have from $10 on a ollar mortgage to $10 and up to $150 on a thousand-dollar for registration, title, inquiry, etc. About how much would te the cost now on a farm loan?
OMPSON. In presenting our data, Mr. Chairman, to the sub- of the joint committee on rural credits, we thought best e the average for interest with the averages for commis- h could be put on an annual basis conveniently and fairly

AIRMAN. Yes.
OMPSON. We did not see fit to try to combine with that the averages for abstract of title, for instance, and other costs. the sum of those first two items is presented, and I think ariation in the other items, due to character of the loan ch that it is of doubtful value to try to give a total.
AIRMAN. I am inclined to think that you are correct about at the average cost on farm loans would be anywhere from cent for interest, and from no per cent to 2 per cent for s, plus whatever charges are customarily charged in the community for inquiry into the title, registration fee, etc.?
MPSON. Yes, sir; that is correct.
AIRMAN. And each member of the committee, from the of his own community, would have to estimate the other

MPSON. Yes, sir.
IER. What did you find in the States with reference to the taxation to loans? In Pennsylvania, the lender has to . Did you find that varies in the States?
MPSON. Yes, sir.
IER. What is the variation?
MPSON. The subject of taxation has undoubtedly a very ation to interest rates in the States. I may say that such as we have, as well as such conclusions as we can draw of our general knowledge, leads us to state that, in our re is a definite relation between the tax rate and the in- charged upon loans.
IER. In the State of Pennsylvania, a man could make a per cent so as to get 5 per cent. I know it plays an im- t up there, because they make a loan of 5.4 per cent so 5 per cent and still cover the tax.



ın, which is very small. The Government takes over the
lity and issues a certificate, and in case any other party
ıfterwards the Government is responsible.
OMPSON. We are thinking about the same thing. When I
ificate," of course, it was a Government certificate that I
ıd. It seems to me there are obvious advantages in having
e system.
AIRMAN. Are there any further questions?
BEY. The difficulties we have in our country under the
nditions are that a man borrows $5,000, and when his term
is no better able to pay it than when he began; he is com-
borrow again, and so there is a repetition. Have you
the question of having him pay a higher rate, and pay
the loan in installments, so that at the end of a certain
will have paid off the loan? Have you taken up that

)MPSON. Yes, sir.
3EY. Can you give the committee a little information on

)MPSON. That would come, I take it, in any suggestions
be made with reference to proposed improvements.
IRMAN. Yes.
EY. The question as to appraisals would, I take it, include
f matters.
MPSON. Confining our attention first to the farm-mortgage
m, it seems to me that anything that will tend to encour-
avings or render local capital better available for farm
be encouraged; and likewise anything that will facilitate
f distant capital into any given locality where farm-
oans are being asked for. Now, as stated in the earlier
testimony, where we find high commission rates we also
ely large amounts of capital coming from the outside.
it is important that such localities should be able to get
ital in an economical way.
to me that it is also important in those localities to lend
ragement possible to the building up of suitable facilities
ımulation of the local capital, for the reason that you can
up a substantial credit system in any locality unless you
on to the garnering of local savings and building up of
l as a part of the program. In other words, if you do not
show that there is some local capital available, the chances
u are not going to inspire confidence in outside capital
I am not attempting to minimize the importance of
side capital, but I believe you will find, in those sections
ry where they have built up the best credit systems, that
accumulated, as part of their business, a considerable
the local capital available for that particular kind of

handling the outside capital, which, under existing condi-
ınder any conditions, would have to reach across and
veral States, it seems to me that relatively large institu-
very well be established.
RMAN. What do you mean by "large institutions"? Have
g specific in mind?

Mr. THOMPSON. I am thinking now of institutions that w serve in the nature of factories, to assemble well standardized n gages and convert them into liquid securities and be of such cha ter as to go into the best investment markets and market the secu to the best advantage.

The CHAIRMAN. Interpreted into present day thought on subject, you have in mind a system of land banks, to convert mortgages into farm bonds?

Mr. RUBEY. He has not finished answering my question. I d think you got the question. I am trying to get at the amortiz feature.

Mr. THOMPSON. Going over the explanation as to what the tively large institutions would be, it would be important to ex the features that would enter in. Naturally there is the que as to what is required when you come with a bond that will flo the market at a low rate. What are the requirements of such a b What kind of mortgage can you put under it, in order to mak bond go into the market and take its place alongside other invest bonds? One of the things is the time element. Another elemer tering in is the question of standardization. Now, if the mort runs a certain length of time, great care must be taken to see tha security is kept up and that there is no depreciation during the of the mortgage. The amortization requirement is one mean improving this security, since it gradually reduces the debt the security remains the same. That is one reason why that has given such important consideration. Another reason is that farmers, for instance, who are willing to take a loan and co with the amortization requirement will automatically, as time p not only pay the interest but the principal, and when a certain has elapsed the debt is paid.

Mr. RUBEY. As to the rates, have you figured out what would proper rate to have in order to carry out and pay off loans, s 20 years, 25 years, etc?

Mr. THOMPSON. You mean amortization tables?

Mr. RUBEY. Yes.

Mr. THOMPSON. We have amortization tables at hand to you, which are really a part of the exhibit.

Mr. REILLY. I had the same thought that Gov. Rubey had in m You pay 5 per cent, with 1 per cent to get the loan, to agent, and then it provides, in most of those loans, as I understan that you can pay a part of the principal on any interest-paying Then, if you pay a portion, say one-half or one-third the first if you figure out the interest, you would have to pay for the w loan.

The CHAIRMAN. That is all worked out in standard amortiz tables.

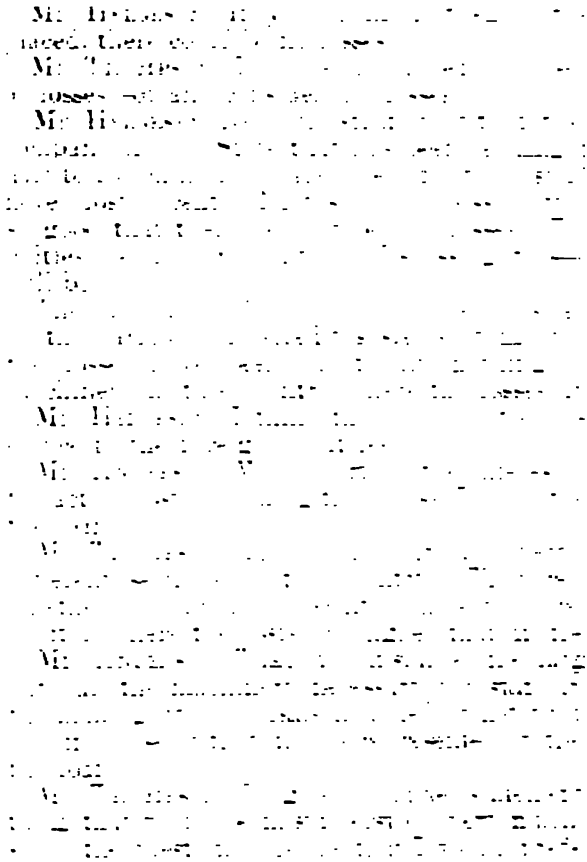
Mr. THOMPSON. As I said, a moment ago, we have in one of bulletins which is here as an exhibit a number of these amortiz tables.

The CHAIRMAN. I will have to ask one question in connection that. I do not believe it was asked before the joint committee. I you determined what effect, if any, the principal of amortization in reducing the rate of interest on a given loan? Does the fact the investor knows that repayments on the principal are bound t

iodically have any effect on him in making a lower rate
t?
OMPSON. It does, undoubtedly.
UGEN. Is it not a fact that in all loans that are made the
has the right to pay $100 or any multiple thereof on any
ıying date?
)MPSON. In some sections that does apply.
UGEN. Not all?
)MPSON. No, sir.
UGEN. To what extent is that practiced?
)MPSON. That is a very common practice in the corn belt.
JGEN. Where good security is offered?
)MPSON. It is being introduced to some extent in certain
ons.
LGESEN. Mr. Thompson, it struck me that your reply a
was somewhat conflicting with the former testimony. You
vhere a certain percentage was paid back in amortization
:nd to lower the interest, that is, that the lender would be
accept less interest on a short-time loan, and I understood
previously that the lender would lend the money for a
ı a long-time loan?
)MPSON. I think not. In the case of amortization loans,
o be assumed that the investor himself gets back those
)n payments. It is the big land banks that get them back.
IRMAN. That is the way.
3ESEN. That is what I wanted to bring out in my inquiry.
urther question: Have you ever, in your investigations,
) determine in the various States what the actual loss has
'm-mortgage loans for the last 10 or 15 years, after the
shod methods in which they have been placed?
MPSON. I think, before you came into the room, Mr. Con-
he question was raised and a statement made.
IRMAN. Yes.
MPSON. But there is not, as far as my information goes,
: relation between actual loss and high rates, and yet I
to add this, that when I stated a moment ago that the
represented present conditions I would not imply that
t investigated historically the farm-loan situation. We
have not only looked into present conditions but we have
ı study of the changes in the loan situation, going back
in period of time.
:ESEN. I presume you will concede that in the enactment
ıortgage law that, if we should pass any such bill as that,
)rincipal things necessary would be the probable amount
do not care if you give it now, but if you can furnish
ation, if possible by States, it certainly would be very

RMAN. It seems to me, Doctor, your best answer to that
e losses on that kind of security in countries where they
tablished systems of rural credits. Could you give that

IPSON. Mr. Chairman, I take it that in the establishment
)an bank system one of the primary aims will be to make
a means of standardizing farm-mortgage securities. As



f the farm-mortgage loans in Iowa come from the insur-
anies. That is practically outside capital, and yet there
alk of business there that you can run it on a very small
anyone who is familiar with the situation knows. Let me
ecific phase of the situation, by way of illustration: In ap-
farm in some localities, it may be necessary to send the
me distance; then the man has to have a rig, he has to pay
day for his board, besides his railroad fare, etc., and all
s into the cost of inspecting or appraising that land.
at situation with territory where there are many loans,
rganized machinery, and where the appraiser can use an
He has a list of prospective loans which he covers
in a day. He sees, say, 9 or 10 farmers between morn-
ht, and it costs him, perhaps, $1.40 or $1.50 per farm to
ou see the wide contrast with reference to that one item.
ESEN. You are speaking about insurance companies' loans
de by the insurance companies?
MPSON. Every big insurance company standardizes its
ies. I am not speaking of the small ones that go into
to buy loans, but I am speaking of the large insurance
which have their own field appraisers and do not finally
nortgage loan before their own field appraiser has seen
al farm and given his appraisal on it.
EN. I will state this: I have been doing business with
years, and that is not the fact. The fact is this: You
ne land appraised by some competent person who knows
bout the land. When put in, the appraisal is made by
ho have knowledge of the quality and value of the land.
PSON. I believe the gentleman is from Iowa?
EN. Yes.
PSON. I am well familiar with the conditions in Iowa.
rviewed the district agents of the lending insurance
n Iowa and know their methods. Of course, they say,
e gone over a district manager's territory, and know
s, and have made a record of them, we may not have to
hose particular farms again at that specific time; but
ays got a specific appraisal of a given farm in every
re we accept the loan."
EN. In Iowa about 95 per cent of our land is tillable
iform, and a State agent has knowledge of all the coun-
he land which is not tillable, which is the narrow strip
the Mississippi River. Outside of that, land is quite
alue. Of course, it varies in counties, but in the county
s not very much variation, and by getting an accurate
f the land and an appraisement by the neighbors, they
etermine at the head office the value or near the value

PSON. It was explained before you came in that part of
t of these companies consists of charts, tabulations, etc.,
ffice, gathered from year to year, which they can con-
ction with any specific loan.
. I have had a great deal of experience in farm loans.
known an insurance company to make a loan in the

ıce? Is the proposition for Iowa to loan its credit to
ıd thereby increase Georgia's security?
MPSON. I do not understand it that way.
GEN. Probably not to that extent, but to what extent
take care of the difference in the security? The land is
verybody has his opinion as to its value; and, so far, Geor-
e of these other States have not been able to attract the at-
eople with money. How are you going to overcome that?
the productivity of the soil determines the value.
MPSON. The discussion so far this morning has made it
e realize that there are many factors that enter into this

GEN. What is the most important factor in making a

RMAN. Let me say that Dr. Thompson covered that this
'ore you came in.
r. Yes; and he is sick, too.
EN. That has been covered?
RMAN. Yes; not only this morning, but he has covered
0 pages of testimony before, which I will have sent to the
the committee.
E. The point is, as I understand, that he wants to stand-
ia's securities and to standardize Iowa's securities. In
taking a piece of land that is worth only a thousand dol-
n amount would be a reasonable loan to make upon it;
60 acres would only justify a five-hundred-dollar loan,
s in Iowa could stand a ten-thousand-dollar loan. That
is it not?

N. Yes; but let us see about this standardization. Is
o take John Jones's farm, worth $20,000, and to put it
ınal security to Tom Thompson's farm, worth $10,000,
ıle Thompson to borrow more money on his farm?
MAN. No, and Mr. Thompson has not made any such

N. If guaranteed by the corporation holding the bonds,
it amounts to. If a loss, the loss must be made good
the profits, capital, or stockholders, then how is the
sed upon?
MAN. Mr. Thompson in his testimony before the joint
rural credits spent two days on it, so that his detail of
: available to you. I do not want to overtax Dr. Thomp-
st out of bed.
N. Mr. Chairman, what I would like to know is, who
his movement, this farm credit, and all these schemes
n proposed? Is it in the interest of the bankers and
ıpanies, who come before this committee and seem so
:er this movement, or is it in the interest of the farmer?
tter, then give us some workable plan and we will all
d assist you in any way we can. But if it is in the in-
ankers and these large insurance companies, I think
capable of taking care of themselves, for I hardly be-
department or Congress can assist them very much in

their business. They are trained in that line of business and w be able to take care of themselves very ably.

Mr. THOMPSON. Is that a question?

Mr. HAUGEN. Yes, that is the question.

Mr. THOMPSON. I can say that, so far as the aim of the Departm of Agriculture is concerned with reference to this particular inve gation, it is to study ways and means of improving the farm-l situation, so that the farmers can secure credit on more reasona terms, if possible.

Mr. HAUGEN. And make it easier for the insurance companies. Mr. Anderson stated in referring to the expense of making the lo The farm-credit system would take care of all the expenses, all papers, and all the applications, and not only turn over the sec ties, but turn over the credit of the institution, which, of cou includes all the farms to the extent the loans made and held by organization, its capital, surplus, profits, and whatever else may pledged.

Mr. THOMPSON. Is that a question?

Mr. HAUGEN. That is the question.

Mr. THOMPSON. That covers a great deal; it covers a whole syst or a whole plan, I take it.

Mr. HAUGEN. Would you hold that it would be for the benefit one or both, or jointly?

Mr. THOMPSON. Our primary aim is to work in the interest improving farm-loan conditions, so that the farmers may get lo on better terms than they now get them.

Mr. HAUGEN. With the end in view of suggesting some plan making the loans?

Mr. THOMPSON. With the view of furnishing all possible assistan

Mr. HEFLIN. So that the farmer can get loans on better terms a for longer periods of time?

Mr. THOMPSON. I include all those things when I say "bet terms."

Mr. HAUGEN. In order to carry out this plan, would it be necessa for John Jones to lend his security to Tom Thompson?

Mr. THOMPSON. Suggestions have gone to the joint committee rural credits, and, as the chairman has said, they are in the rec now. Now, we have other things as well which I had in mind speak of.

The CHAIRMAN. I wish you would.

Mr. HAUGEN. Have you discovered any way of dealing with t matter of security, other than one man loaning his credit to anothe

Mr. THOMPSON. We know of no substitute for security in cred

Mr. HAUGEN. Then, if John Jones has a farm worth a thousa dollars, and he needs $2,000, the only way that he could get t money would be for him to furnish more security?

Mr. THOMPSON. That is the assumption.

Mr. HAUGEN. Is it the plan that the security of others shall added?

Mr. THOMPSON. The problem of rural credit is just as much problem of withholding credit where it will not be properly used properly based as it is to extend credit where it will be proper used and properly protected.

EN. If I am taxing you too much, let me know, because
at to overtax you. Let us say that here is a farmer with
dollars security. That is all that any man will loan him
e of property, but he needs $2,000. Now, is it the aim
rtment to enable him to secure a two-thousand-dollar

PSON. I do not know that it is. I have not had any such

EN. If a thousand dollars is all that could be safely
ie piece of property, how are you going to improve on
on? Here is a loan company which says, "We will
nd dollars." Now, that is all the security in sight. He
thousand dollars to-day. Now, where are you going
n it and increase his loan? That is actually what it is
ousand dollars—and that has been determined and
by everybody.
'SON. In our early discussion we pointed to a number
at affect the loan situation, showing that improvement
ble along a number of lines. We admit that there are
hich improvement is impossible. It is not to be assumed
do the impossible. It is to encourage the kind of im-
at will recognize economy and the fundamental prin-
lit and which will not violate any of the principles of

N. I agree with all that.
. On the matter of your standardization, you are not
at he can get credit or a loan beyond that stand-

'SON. No.
N. It is easy enough to talk about "standardization"
est, but how is it going to be done? When you speak
what are your standards? How are you going to
security? I think that we agree that the security back
tely the most important factor in getting a loan. We
at, I take it?
ON. Yes. The explanation was made earlier here that
d be to improve the facilities for the accumulation of
vailable for investment for farm loans.
. Yes; I agree as to that. There is no question about

SON. Another way will be to make more economical,
means of contact between farmers and distant invest-

. All right; we will agree about that.
SON. There are two important lines of improvement.
. But you have to have the security. You have not
t.
SON. There you are suggesting things that we have
sed. For instance, it has been stated here that farm-
ide, need to understand the elements that enter into
ity in farming. The differences in their farms and
ming have much to do with the credit they can com-
e. There are many avenues through which improve-

EN. Let me finish. This marketing proposition—no hear-
eld in this committee. We have this whole system, partic-
out any hearings or investigation beforehand. We started
l appropriation, and the indications are now that it will
llions of dollars. Now, here we have another proposition,
t thing we know we will be committed to a proposition
ut with twenty or thirty million dollars at first, and it
ll finally cost the Government hundreds of millions of dol-
not know what the policy of the present administration
the President says he is for it, and another he is against
the policy of the administration to take up rural credits,
hese witnesses and know something about it.

IRMAN. I would say, in answer to that, gentlemen, that
its last session appointed a joint committee on rural
e gentleman from Iowa was a member of the conference
vhich agreed to that. That committee has been engaged
ork since early in November. Mr. Thompson appeared
committee and spent more than two days in giving his
That testimony is printed, and I have directed the clerk
mittee to furnish each member of the committee with a
t printed testimony. Furthermore, the committee took
om members of the Reserve Board and from the Comp-
ie Currency, and in addition to that we had testimony
committees of Congress last year. We had all of the
the subject that was available printed for the use of the
omprising probably twenty-five or thirty thousand pages,
available likewise to the Members of Congress. This
oes not have jurisdiction in the reporting of this rural-
If it did have, and if we were studying this question
vould say that we could go on with a lengthy discussion
osition. Personally, I would not be willing to base my
upon any conclusions that Mr. Thompson might reach
uld desire to bring in witnesses from different sections
ry who have information on the subject. But if the com-
es to go into this matter exhaustively and to cover again
at has been done by the Banking and Currency Com-
e Senate and House and the other joint committee of the
Senate last year, and likewise the testimony that has been
the commission that visited Europe some years ago, I
p to the gentlemen of the committee as to that. That is
t.

EN. Mr. Chairman, by act of the conference committee
f Congress, this matter is squarely before this committee.

RMAN. Not at all.

EN. Absolutely. They provided for a joint committee,
properly before this committee as it is before the Com-
anking. In bringing this matter up I do not want it
that I am questioning the excellent work done by this
ttee. That committee did good work. But here is a big
and if Congress is to deal with it this committee ought
e matter thoroughly. Of course, the chairman has more
f what is the intention of the administration, and, if it
ural credit now, as was done last Congress, by not acting
nply referring the matter to a subcommittee, there is no

MPSON. If you will turn to the wording of the appropria- you will notice it says:

the Secretary of Agriculture to make studies of cooperation among he United States in matters of rural credits and of other forms of in rural communities; to diffuse among the people of the United l information growing out of these studies in order to provide a roader utilization of results secured by the research, experimental, tration work of the Department of Agriculture, agricultural col- ate experiments stations.

at to show that this topic, rural credits, is one of several ch we have been asked to study under a larger topic of and organization, and that in connection with our organ- dies or studies of cooperation we have been asked to tain lines of information, such as those that have been ere this morning, with reference to costs, conditions, and but, inasmuch as it comes under the item of cooperation the question of how far improvement is possible through n among farmers themselves is more particularly the , and therefore some study has been made to see how far t parts of this country organization for credit improve- aken place and what information, if any, of value along ight be obtained.

ELL. Under this item, have you considered that it is your recommend to this committee or to Congress any par- d of legislation regarding rural credit, or is it just to ormation upon which some committee may base its action?

MPSON. The latter.

IRMAN. As I understand, the policy of the Department of and all other departments is not to make recommenda- r than those contained in their estimates, except when o do so by some action of Congress.

ERSON. To what extent do you find that the cooperative ns which now exist can lend themselves to rural-credit nd in what way?

MPSON. That suggests the propriety of presenting one bul- has been prepared by the office, Farmers' Bulletin 654, ners may improve their personal credit," and the illus- d the data given there refer more particularly to how hrough organization, have improved or may improve nal credit. If you will look into that bulletin, you will under the first division there are three plans outlined been employed in different sections of the country. I do whether you want me to go on and explain what those r not.

ERSON. I do not care to have you go into anything that is tin. now. I was simply wondering if you could state in vay, briefly, the relation between the ordinary shippers' ns, cooperative creamery organizations, and other organ- nich now exist among farmers, and discuss the general

MPSON. Of course, that suggests an aspect of the question st a little aside from what I am speaking of. The financ- nizations themselves for organization purposes—for in-

Mr. STEELE. I understand, but I supposed he had figured out

THE CHAIRMAN. Mr. Thompson has made some suggestions t

Mr. RYAN. Mr. Hagen says he wants this language put in

have put into the record. Is it the second paragraph?

GEN. It is the subterfuge that was provided for to avoid

Y. You were a member of the subcommittee.
GEN. Of the conferees. Yes, indeed, and, knowing the
ie Democratic Party as to adjourning without passing a
appropriation bills, there was nothing to do but to agree
rfuge, after the President and the Secretary of Agricul-
clared against rural credit.
MYER. Did you make a minority report?
EN. Oh, no; it was simply a choice between having the
on bill defeated or standing for the subterfuge.
Y. I make this point: The language referred to by Mr.
ot in the present appropriation bill.
EN. No.
Y. It is down here as having been a part of the bill last

EN. Exactly.
Y. It is inclosed here in parentheses, which indicates that
he bill and not to be considered at this time by this com-

EN. That is the act of last year which referred the whole
e two committees instead of to one.
Y. I desire, Mr. Chairman, to read this paragraph:

is hereby constituted a joint committee of the Senate and House
tives, to consist of the chairman of the Senate Committee on Agri-
'orestry, the chairman of the House Committee on Agriculture,
rman of the Committee on Banking and Currency of the two
wo other members of each of said committees, to be designated
an of the respective committees, and it shall be the duty of said
e to prepare, after such investigations as may be deemed neces-
ort to the Congress on or before January 1, 1916, a bill or bills
the establishment of a system of rural credits adapted to Ameri-
conditions.

t committee was appointed and directed to report to
the 1st day of January, 1916. Its work has been com-
is made its report to Congress, and I hold that it is not
nce of this committee to act any further, so far as this
concerned.
EN. It reported it to Congress here to take notice of it
onsideration, and it has been held by this committee that
ee has nothing to do with it, and will not hear witnesses
ect.
RMAN. And, Mr. Rubey, you may say further that the
ie joint committee was referred to the Committee on
d Currency of the House, as well as to the Committee
and Currency of the Senate, and not to the Committee
ire.
LL. How much further will we go with the question of
?
RMAN. Mr. Thompson, take up your next line of work, if

PSON. I would like to put into the record, because other-
ill be nothing here to show what we are planning to do
estigations we are aiming to continue to carry on, if
carried on——

gated, or whether it means that he will take up one phase
position at a time and be questioned about that before
nother phase?
AIRMAN. I would rule, Mr. Anderson, that, as he completes
of the question, interrogation may be had.
DERSON. Then I have no objection to it.
otion was thereupon put and unanimously carried.)
AIRMAN. Proceed, Mr. Thompson, in your own way.
OMPSON. I should present, perhaps, two illustrations to
thing of what has been attempted in the matter of actual
in organization for credit improvement. One of these
the Scott Cotton Growers' Association, of Scott, Ark. I
is, because a group of farmers, 20 in all, there agreed to
orm of agreement, which was worked out in conference
hem and a representative of our office, and they have
organized for the purpose of indorsing farm-mortgage
embers. If the committee desires it, we could leave a sam-
memorandum of agreement adopted by that group of
howing what they have agreed to do voluntarily for the
nt of their mortgage credit.
GESEN. That would be interesting matter to go into the
ause these suggestions have been made before—that farm-
rganize without laws.
AIRMAN. Without objection, that will be included in the

tter referred to follows.)

showing form of agreement adopted by the Scott Cotton Growers' Association, of Scott, Ark., relative to farm-mortgage loans.

MEMORANDUM OF AGREEMENT.

undersigned members of the Scott Cotton Growers' Association of
hereby agree to use our association for purposes of farm loan im-
members according to the provisions of the following by-laws:
rd of directors shall appoint annually a committee of five, to be
edit committee, which is to have general charge of all loans made
with the indorsement of the association.
edit committee is to consider all loan applications from members.
applications meet with the unanimous approval of the committee.
to prepare a signed certificate of approval and submit the same to
of the association. The indorsement of all loans by the associa-
made by the signature of the president and secretary in the name
ation.
plications for loans shall be made out on an application blank
the association. For this purpose, application blank under Exhibit
dopted.
praisal of farm-land security offered in connection with members'
e made according to the forms shown under Exhibit II. Said
shows the form in which the approval of the appraisers by the
ttee is to be certified.
ort of the appraisers on the value of farm-land security shall be
ng to the form indicated in Exhibit III.
pproval of all loans made with the association's indorsement for
ll be certified according to the form under Exhibit IV.
member securing a loan with the aid of the association's indorse-
ired to pay all specific costs connected with the perfecting of the
h as appraisal, abstract of title, recording fee, and other charges.

STATEMENT

1. Acres cleared from stumps, ———.
2. Acres partly cleared but not free from stumps, ———.
3. Acres capable of being cultivated ———.
4. Acres upland, ———.
5. Acres marsh, ———.

pen swamp, ———.
illy and unfit for cultivation, ———.
imbered, ———.
fenced, ———. Kind of fencing, ———.
of soil, ———.
l level? ———.
ick pine? ———.
one? ———. Any sandy land? ———. Number of acres sandy,

f timber growing on land, ———.
ted amount of each kind of timber, ———.
ou a well? ———.
of your nearest railway station, ———. Distance from land, ———.
of railway, ———.
ce to nearest market, ———.
of county seat, ———. Distance to same, ———.
of and distance to other nearby villages and cities, ———.
ar is the land from Little Rock? ———.
served by good roads? ———. R. F. D.? ———.
ce to public schools is — miles.
mber of acres of land in crops are ———, and the kind of crops
———.
ops on the cultivated lands have been rotated as follows: ———
I will rotate the crops grown on this land during the term of this
eful and reasonable manner ———.
many years has the land been cropped? ———.
ere any streams passing through the land? ———. Is the land on
d? ———.
ildings on the land are as follows: House—frame (brick or log)
. When built, ———. Present value, $———. Kind of roof, ———.
lation, ———. Stories high, ———. Size of house, ———. Size of
—. Insurance, $———.
other buildings: (1) Size, ———. When built, ———. Present
—. Frame or log, ———. Basement, ———. Insurance, $———.
———. When built, ———. Present value, $———. Frame or
Basement, ———. Insurance, $———.
———. When built, ———. Present value, $———. Frame or
Basement, ———. Insurance, $———.
ed the property above described for ——— years. Since acquiring
ave cleared ——— acres and have erected the following buildings:

nds in the immediate vicinity of this land are selling for $———
improved lands for $——— per acre.
lue of this land is $———. The value of the building is $———.
f land and buildings is $———.
ildings are insured for the following amounts: Fire and lightning,
nado, $———, in the following companies: ———, ———.
occupy the premises, ———.
the following live stock: Horses, ———; mules, ———; colts and
; milch cows, ———; other cattle, ———; ages and sex, ———
, ———; shoates, ———; sheep, ———; lands, ———.
the following farm machinery and implements: ———, ———.
are no liens, judgments, nor foreclosure proceedings started nor
ast me nor this property.
are no taxes against me nor my property due and unpaid except
—.
perty is now encumbered as follows: ——— ———, the interest
paid to ———.
other property than that offered as security in this application,
—.

KANSAS,
of Pulaski, ss:

swear that the foregoing statements and answers are true; that
ner of the within described premises offered as security for the
for; that I am in actual and peaceable possession of the same;
e and possession have never been questioned; that there are

[illegible] unrecorded deeds or mortgages existing against [illegible] are no judgments against me in any of the courts of [illegible] or in the United States courts; that I do not owe [illegible] builders or others for work done or material furnished [illegible] on said premises; and that there are no [illegible] except as hereinbefore stated, and these will be [illegible] the loan applied for are paid over to or are paid out for me.

Dated at ———, the —— day of ———, 19——.

——————

Subscribed and sworn to before me, this —— day of ———, 19——.

——————

My commission expires ———.

I, ———, wife of ———, [illegible] application.

——————

APPRAISAL OF PROPERTY.

Nomination by appraisers.—I nominate ——— and ——— as impartial, experienced, and otherwise qualified persons, freeholders and residents of the town of ———, county of ———, State of Arkansas, to appraise my property herein described and offered as security, as a condition precedent to the granting of the loan applied for.

Approval of appraisers.—The appraisers above nominated, being freeholders in and residents of the town of ———, county of ———, and State of Arkansas, wherein the real estate of ——— ——— the signer of this application, is situated, and being otherwise qualified and competent, are hereby approved.

———, ———.

Credit Committee of Scott Cotton Growers' Association.

REPORT OF APPRAISERS.

We, the undersigned, freeholders in and residents of the town of ———, county of ———, State of Arkansas, do hereby certify that we and each have personally viewed within the past month the ——— section ———, township ———, range ———, and the ——— section ———, township ——— range ———, and the county of ———, Arkansas, do hereby certify that and each of us are well acquainted with the said premises and with the value of lands adjoining; that we are not interested in said premises or in the action that may be taken upon this application; that we have carefully appraised said premises, and that in our best judgment the market value of the same exclusive of buildings is at present time ——— dollars ($———), and that the buildings thereon, ——— in number, are worth ——— dollars ($——— making a total valuation of ——— dollars ($———).

———, ———.

———, ———.

Appraisers.

APPROVAL OF THE CREDIT COMMITTEE.

We, the undersigned, after careful consideration of the foregoing application and reports thereon and certificates attached thereto, and being otherwise fully informed as to the premises offered as security for the loan sought, said premises being ———, section ———, township ———, range ———, county ———, State of Arkansas, and containing in all ——— acres of land and buildings (to wit: ——— ———), thereon, have arrived at the following conclusions: ——— acres of said land can be carefully cultivated; ——— acres are under cultivation; ——— acres are fenced with ——— fencing; the soil is ———, and of ——— quality; the surface of said land is ———.

To the best of our knowledge and belief all of the statements of the applicant in [illegible] application are true, except ——— ———. Improved land in the neighborhood of said land is worth $——— per acre. If offered at forced sale this property, including not less than $———. A fair valuation of this property is: Land $———; buildings $———. Total, $———.

t is a person of ——— character and credit, and is said to meet
. He is temperate, lives ———, and has ——— been making
ends to use the money to ——— ———, and we are satisfied that
purposes will benefit him.
r satisfied that the applicant has a good merchantable title to
hereby approve the foregoing application and recommend the
loan applied for.
——— day of ———, A. D. 19—.

———,
———,

Credit Committee of Scott Cotton Growers' Association.

ERSON. Leaving the topic of mortgage credit, I will say
e worked out tentatively articles of agreement which
ewhat one of the plans referred to in the bulletin. A
p of farmers in one locality in northern Wisconsin
organized a farmers' credit exchange, and the articles
on were provided by the Office of Markets and Rural
of the United States Department of Agriculture.
orm of organization for personal credit improvement.
N. Doctor, that is the practice, to some extent, in various
present time; a number of organizations such as you
been perfected?
ERSON. We find that the particular organization to which
ıg here, having these articles of incorporation which we
l, varies somewhat from any we have known about.
EN. But it is possible for anybody now to incorporate
ate laws and to do exactly the thing sought by some
is rural credit?
ERSON. It is possible to organize unincorporated volun-
ıtions to do certain things.
EN. It is possible to incorporate under the State laws, is

ERSON. The State laws vary considerably, and it depends
f organization you have in mind.
EN. I mean for loaning money.
ERSON. If you have reference to a cooperative loan asso-
l say there are only a few States now that have on their
laws for that purpose.
EN. If they could under no other law, they could under
s, authorized to make loans?
ERSON. If that is the kind of organization they want, yes.
EN. Can you give this committee the number of schemes
l thought up by the different promoters of the scheme?
e are a great many. You have more information as to
ave—a good many schemes proposed, or plans, or what-
ht call them.
ERSON. I trust that it is clear that we are not dealing here
schemes proposed from different directions.
EN. Well, call them "plans."
ERSON. We are dealing with such plans as commend them-
s useful and worthy of careful study.
EN. The plans that commend themselves to you? Is it
to do the same thing under the State laws?
ERSON. Not always, and in many States not at all.

Mr. HAUGEN. In many States, how
Mr. THOMPSON. Yes, in some, but
Mr. HAUGEN. The agreement
personal credit organization is short
that out in the record.
The CHAIRMAN. Just without ob

ARTICLES OF

total amount of indebtedness thus created against the members
ge exceed the sum of ——— dollars. Such obligations shall be
ame of the exchange, and shall be signed by the three members
e committee.
a requirements and general supplies purchased by the exchange
) members on such terms as the executive committee may deter-
the full purchase price be not paid to the exchange on delivery
the amount unpaid shall be secured by satisfactory two-name
chattel mortgage on cattle, implements, or other property unen-
such other security as the executive committee may require.
shall be purchased by the exchange except upon written appli-
)y the member desiring the goods and stating specifically the
uality desired.
utive committee shall be empowered to add to the cost price of
by the exchange a uniform commission, not to exceed — per
l cost of the goods, to pay the incidental expenses of transacting
the exchange.
er may resign from the exchange while indebted to it. A mem-
d to the exchange may resign, with the consent of the executive
giving ——— days' notice, the same to be duly published for
ive weeks in ———, a newspaper published in ———.[1]

ement shall continue in force for three years from date: *Pro-*
iay be sooner dissolved, at any time the exchange is out of debt,
vote of the total membership. It may be amended by a two-
he total membership at any time when the exchange is out of
se with the consent and approval of all its creditors.
iereof, etc.

———— ————.
———— ————.

N. Can you give us a statement of what the agreement they propose to do?

SON. They propose to let an executive committee act on association, and negotiate loans for the association on l several liability.

N. One loaning his credit to the other?

SON. Yes.

N. Is that one of the plans approved by you?

SON. That is one of the plans which have been adopted; ed out the forms, it was adopted and taken as the form n in one of the localities I have stated.

N. Do you suggest that by way of legislation?

SON. It is not legislation at all; it is merely voluntary

N. It has no reference to your recommendation as to [f we are going to have legislation, shall it be along o make myself clear, I should be opposed to a plan va people would be compelled to loan their security up against these States that pay three times the rate t our State pays, as I infer that the security in those less desirable than it is in ours.

That is not the intention, Mr. Haugen, as I under-

SON. I think your statement is clear, and I think it is on. Then, further, of course, in our studies of rural are other topics that we have been asked to study,

[1] must be made to conform with whatever State law the organization mably the law governing partnerships.

[illegible] I would like to [illegible] showing the [illegible] farmers mutual insurance companies in the United States. Each one shows you where a mutual company is located, so far as we can present information to you, for the [illegible] number of companies that we could get in long enough for us to make a representation of the farmers mutual insurance company.

Mr. ANDERSON. Will you state how many of them

Mr. THOMPSON. There are over 2,000 farmers' companies in this country, including organizations that [illegible] and which [illegible] them to [illegible]. Our present [illegible] for farmers' fire insurance companies [illegible] for insurance of the stock in fire [illegible] and [illegible] combined.

I would like to call further that we [illegible] the insurable property protected by these companies exceeds five [illegible] dollars, and [illegible] annual reports which show that the value of the property on farms in this country, including implements and machinery, is less than [illegible] Now, increase this figure to [illegible] perhaps fifteen billion dollars, this showing that [illegible] the total insurable property on farms in this country

Mr. SMITH. You would encourage that line of [illegible]

Mr. THOMPSON. Yes. As to the [illegible] organized [illegible] mutual [illegible] One [illegible] legislation in the various State

, because they do not have anything to help them formu-
e importance of this study, I think, is not confined to
sections, where the work has not been so well developed.
go into some of the most densely populated mutual in-
pany sections you will find variations in the cost of
those insurance companies, running all the way from
housand to 30 or 40 cents a thousand among companies
ar each other and where the conditions are substantially
ill they are not able to run on the same basis. There
why these costs are different. We find the companies
ious and glad to get this information when they can,
eve it is important to settle it as quickly as we can.
stration would be the way in which they handle their
ir accounts, and how they conduct their business.
fferent classes of these companies—live stock, hail, and
s well as fire—and it is believed that study should be
h of those classes and separate consideration given to
view to developing and aiding them as much as possible.
t all I care to say.
N. Do you think it is the function of Congress to go
te legislatures to encourage or advise them or to edu-
w to legislate?
PSON. It has been, as I understand it, the policy to
rmation regarding conditions in some States to other

N. The expense is in proportion to the losses, I take it?
PSON. The expenses depend partly on how the business
that in turn is determined partly by how much the
ws about running the business.
N. For instance, I insure in three counties. The con-
e same. They have exactly the same general conditions
ent. There is an assessment in this county and none in
The assessments are made to pay losses. Now, is there
educe the losses?
'SON. There is a way of improving the situation in ref-
es.
N. We find in one locality a good deal of rain at the
putting up their clover; a great many barns are burned
sessments are made; in other localities no losses, hence
s.
'SON. I was speaking of the management of the com-

N. You have reference to the mismanagement of the

'SON. I refer, on the side of expense, to such matters
stem of handling assessments. For instance, the system
ly postassessments increases expenses unnecessarily;
side of losses, I may refer by way of illustration to
ich have not properly classified their risks and which,
n, incur needless loss.
N. And they have their annual meetings and get to-
cuss these questions. Are they not getting along fairly
places where they are incorporated?

Mr. THOMPSON. They are getting along quite well, but could get along better.

Mr. HAUGEN. They could be improved upon.

Mr. THOMPSON. We are getting calls for help right along.

Mr. HAUGEN. I think the excellent work done by the department some years ago was when you got up a volume giving the articles of incorporation and by-laws of all the organizations in the United States. I do not know whether it included all of them, or the number of them. That is available, is it not?

Mr. THOMPSON. It has been printed more than once. It is available to anyone.

Mr. HAUGEN. It could be reprinted.

Mr. THOMPSON. Oh, a great amount of progress has been made since the time, and a great many of those provisions have been changed in the organizations that are going there.

Mr. HAUGEN. In what way?

Mr. THOMPSON. Since the passing of that volume we have had the Lever Act and the Capper amendment to the anti-trust laws to be passed. Section 5 of the Capper Act gives certain exemptions to cooperative organizations, as I pass, and that and what I am now trying to arrange—a progress of organization. I do not find it given in this bulletin. I am being requested to find out the same thing in other cases.

Mr. HAUGEN. Do you think it would be necessary, in order for these people to incorporate?

Mr. THOMPSON. If they want the benefit of that law. I mean to say, you have seen it.

Mr. HAUGEN. Do you mean their whole method of business?

Mr. THOMPSON. In some cases, especially if they are organized with capital stock.

Mr. SWANK. Could not another bulletin be issued?

Mr. THOMPSON. That is what we are working on that. The exemption is to organizations which are organized without capital stock.

Mr. HAUGEN. But very few of them have capital stock?

Mr. THOMPSON. A very large number have.

Mr. HAUGEN. Paid-up capital?

Mr. THOMPSON. Some of them paid-up and some not.

Mr. ROGERS. There are not many failures, are there, in those cooperative organizations or insurance companies?

Mr. THOMPSON. As far as I have been able to learn, this is one of the most successful forms of cooperative organization amongst farmers in the world.

Mr. HOWELL. How long have these been in existence?

Mr. THOMPSON. In some of the States, twenty or thirty years.

Mr. HOWELL. It is nothing new?

Mr. THOMPSON. Oh, no. If you go into the foreign countries, some of them run back many centuries; some to the tenth or twelfth century. It is a very well-established institution in countries like Germany and France.

The next topic, or communication, refers to farmers' telephone companies. We have only begun on this subject, but we find

dred of them are spread over more than 40 States, and
tantly receiving requests for information as to how to
em; either information with reference to their methods
siness or with reference to their methods of financing.
t the mere mention of that is all that is necessary.
IRMAN. Any questions, gentlemen? Proceed, Dr.

PSON. Then, the remaining item comes under what you
cial organization or social and educational activities.
ion of what has been accomplished under that project is
bulletin entitled "The organization of a rural commu-
was printed in the Yearbook and reprinted separately.
brief, is to see ways and means in which organization
noted or organizations utilized for other purposes than
ir ones that have been considered so far. By way of
I might mention the question of the extension of the
f the farmers' club, which is a farmers' forum where
cuss all community problems, similar to a business man's
ir an extension of the usefulness of the club is possible,
ld be done to encourage that; what forms of association
gested; what may be done, as is being done in a few
p them keep up the right kind of a program of work.
nother function would be to help them in studying com-
lems, in cooperation with local agencies. I think the
ing I need to mention is the fact that in much of this
l that women's rural organizations are active, and the
ow far help may be rendered in making them more use-
goes with the other question with reference to farm-

MAN. Any questions?
LL. It seems to me, if I understand the scope of this
is treading very closely on the ground of the extension
carrying on, and I would like to have you differentiate
doing from what is done under the extension work.
PSON. There is a clear line of demarcation between the
doing and that of the Office of Extension, but we are
ose cooperation with them. They are asking us to fur-
th forms of organization for these local organizations,
loing it. They are attempting to disseminate the in-
furnish; our work is more particularly investigational.
SON. You have no men in the field explaining organi-

PSON. We are carrying on experimental studies, and
aking the results available to the extension service.
MAN. Any further questions, gentlemen? If not, we
n obliged to you, Mr. Thompson, and hope we have not
much.
SON. Not at all, gentlemen; thank you.
, at 12.45 p. m., the committee took a recess until
.)

D. The price at which they are sold is estimated to cover preparing, as related to the standards themselves, and incidental investigational work.

RMAN. As to the preparation and sale of these standards otton-futures act, how does that work compare with that item 41, "the investigation and demonstration of cotton and so on?

D. The work done under item 41 is investigational and onal work. Only the actual physical preparation and of the standards is done under the cotton-futures appro- he investigational work has reached the point where we s almost completed. We have just finished an investiga- w tinges, yellow stains, and blue stains. That investiga- ried on under item 41. Investigational work remains to rding length of staple and other qualities and conditions required by the cotton-futures act. Work in demonstrat- dards in the field also must be done under this item, g tests must be made to determine the tensile strength of

RMAN. About how much of this appropriation in item ed in the preparation and sale of these standards?

). I think we can give a relatively fair estimate of that ogram of Work.

IMAN. Preparation and distribution of the official cotton the United States." There is a proposed expenditure That is on page 427 of the program book.

). The amount that would be expended would be prac- me. There would be a slight reduction from that shown im of Work. We really estimate for a very slight reduc- otton-futures appropriation, considering the vanishing he continuing appropriation. The total amount esti- something like $1,500 less than the amount provided for that the amount would be substantially the same as that Program of Work, $35,000. I may say in connection at the sale of standards has netted thus far something $10,000, and in addition to that sum, which has been he Treasury to the credit of "miscellaneous receipts," e $10,000 has been returned also from the sale of cotton n off so that it could no longer be used in the prepara- ards. Altogether from these two sources there has been ething over $20,000.

MAN. What other lines of work have you under this

. There are two other items, Mr. Chairman. The first p is the determination of disputes. There were pre- department during the period up to December 1, 1915, s on future contracts, originating wholly in the New Exchange, as the New Orleans Cotton Exchange has ent any disputes in, having settled their disputes with change machinery. The disputes which have been re- risen in the various delivery months, the heaviest de- being May. During that month we passed upon nearly

D. We do not deal with the question of prices. We indirectly only. The disputes we handle are with refer- ifferences and not to the absolute price.

N. Under the Lever act we meant—I did, as one who had me provisions in that bill—that, where there was a dis- ow many points there were between one grade and an- should submit that matter to you, and you should de-

). I think we arrive at substantially the result you have

N. And you were to find out the differences by consult- kets.

). You are quite right. We are doing that. There are l spot markets from which we receive reports every day erences between each of the grades and middling. The ose differences is used in the settlement of contracts on . Thus we arrive at the same point which you have in

N. You get those points from the spot markets?

). Yes.

N. And use them in settling these disputes?

. We do not use them. It would be more correct to say hange members use them and that we supervise the he commercial differences.

SON. Have you anything there that shows the per- ie grades sustained or grades lowered?

. I have not in hand the material to show that, but we printed form in the course of the next 10 days, with a analysis showing just what was done in each of those e it in this form here, which will indicate to you the re. Out of the 65,446 bales disputed, 4,162 were dis- rade only, 1,644 as to staple only, 350 as to other quali- bales were disputed as to both grade and staple, coming mbination. Then for grade and quality, that is, as to is gin cut, sandy, or any of those other qualities, there taple and quality 192, and then for all three questions— and quality—8,125.

SON. What I am trying to get at is, where the grade was the appeal, in how many instances was the grade sus- n how many instances was the grade either raised or

That will be shown in detail in the case of each of the e publication I have mentioned—the number of cases in nplainants' contention was upheld and the number of n the respondents' contention was upheld.

'. Can you state now whether the majority of cases were vhether they were not?

. I should say that in the majority of the cases the grade was sustained. That is right, is it not, Mr.

vs. Yes.

. That is due to the fact that the respondents largely otton firms, the qualified spot-cotton firms who deliver

[illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

The CHAIRMAN. You have been discussing the matter of the [illegible] Will you discuss briefly the matter of the segregation of future and spot markets?

Mr. BRAND. If it suits your pleasure, Mr. Chairman, I will [illegible] Meadows, who is personally supervising the investigation of spot and future markets, to tell you about that.

Mr. HEFLIN. In the settlement of these disputes which arise [illegible] the differences gotten from these spot markets. [illegible] the exchange people get that information: do you tell them?

Mr. BRAND. No; they get that direct. We have declined to [illegible] that to them, because it seemed to us that we would then assume intermediary relation, which might raise question. We require to secure it direct, and we secure it direct and keep check [illegible] the differences as reported by the exchanges. If they are out of order, if it is a serious matter, we telegraph them, and, if it is a serious matter, we immediately write them; we always come to agreement as to what is the correct difference.

Mr. HEFLIN. You see to it that they do not use bogus reports?

Mr. BRAND. Yes; that matter is checked up each day.

Mr. HAUGEN. The language says that a large amount of this [illegible] is to be used in the enforcement of the cotton-futures act.

Mr. BRAND. Yes.

Mr. HAUGEN. That act has been declared unconstitutional.

Mr. BRAND. A lower court has so declared.

Mr. HAUGEN. And you still insist upon enforcing an act which has been declared unconstitutional by a lower court?

Mr. BRAND. I suppose Mr. Haugen knows better than I do the legal status of a law which has been declared unconstitutional by a lower court. We always consult our Solicitor in a case of this kind and then are guided by his advice. I may say from the economic standpoint, aside from the legal standpoint, that it would be a very harmful matter if the decision of a lower court were allowed to interrupt the enforcement of the act.

Mr. HEFLIN. When the decision of the lower court has been appealed from and the appeal is then pending in the Supreme Court the law is in effect until the Supreme Court either sustains or reverses it.

Mr. HAUGEN. That is a matter of policy. I believe that is the wrong policy.

Let me ask you this question: Does it seem to you likely that the opinion of the lower court will be sustained?

). I think there is reasonable ground for believing that
urt will not be sustained.
EN. It is my understanding that it is generally conceded
ot be reversed, and that a new bill is to be introduced to
e of this law. Is not that true?
MAN. A new bill has been introduced.
EN. To make it constitutional.
MAN. But the new bill was not introduced at all on the
he finding of the lower court was correct. It was intro-
theory that it might be correct, and we could not afford
hances. It was a very small matter of correction, and
r go ahead with that. The lawyers on that proposition
uch.
EN. That is very good; but what I want to get at is
icy of the Government in all these bureaus—whether it
e the policy and practice to continue to hold up people
the decisions of the lower courts.
. I think it would be fair to answer, in response to that
; when an economic injury would result from failure to
v which a lower court had found unconstitutional and
hich there was a great amount of varying opinion, the
vould generally find that it would be to the interest of
d the soundest public policy to continue to enforce it;
been done in this case.
MAN. This happens to come right in this connection,
swer the question more fully than Mr. Brand does:

DEPARTMENT OF AGRICULTURE,
Washington, D. C., February 10, 1916.

HEPPARD,
States Senate.

R SHEPPARD: The department has received your letter of the
which you ask to be advised as to whether or not the interstate
continue to be enforced in view of adverse decisions of some of

e plain that the law referred to is the Federal migratory-bird
e sections of the Penal Code regulating interstate commerce in
of birds and game killed and shipped in violation of the laws
States.
pending in the Supreme Court of the United States, on appeal
nent, the case of the United States *v.* Shauver, in which the
for the Eastern District of Arkansas held that the Federal
law is unconstitutional. The case was argued in the Supreme
r 18, last, but no decision has yet been rendered.
is the duty of the department to enforce the law, and it is being,
ie to be enforced throughout the United States.
ly, yours,

D. F. HOUSTON, *Secretary.*

nswer your question as to the policy that is being fol-
er it is right or not.
. May I say one more word in regard to the acceptance
the trade? It has been accepted almost unanimously
eneficial piece of legislation. In the two great future
two firms are declining to come under its full provi-
e rest have complied in every case where it has come to
determination.
nnection it is also interesting to state that one of the
at is most opposed to the legislation advised us that it

f the cotton and the ginning, that it has not been found
tisfy the trade that the cotton has been correctly classed.
EN. What difference is there between those two grades?
. The two grades you mentioned?
EN. Yes.
. It is about a quarter of a cent, usually. I do not hap-
sheet with me to-day, but that is about the difference.
EN. Say there is a difference of 4 cents between two

. Not 4 cents. It is only a small fraction of a cent—say,
cent.
EN. I do not care what figures you use, but say there
its of difference and that one comes within a point of
ade. In the delivery of that cotton, is it delivered at
the cotton of the grade below, or are the three points
nsideration in the adjustment above?
. The whole question of grades is settled by our cotton
t is put into the nearest grade.
N. In grading it, that is the only thing you can do?
. Yes.
N. But here I buy on the cotton exchange 1,000 bales
the cotton is delivered, and here come 20 bales consid-
oints above the grade which is tendered, which might
lollars difference. Is that taken into consideration in
?
. In our work, Mr. Haugen, if an error has been

N. No; there is no error. I do not make any complaint,
ading.
. I am afraid you do not understand exactly how it
It comes to us with the complaint or stipulation, as
be. If the two parties to the contract have agreed to
spute together, it comes in the form of a stipulation.
herwise, the person receiving the cotton submits it in
a complaint, and the person tendering the cotton is
respond; we call him the respondent, and he submits
hat form.
N. Suppose I sell you 1,000 bales of strict good milling
e. I tender you 1,000 bales of the grade below, which
lls for $40 per bale. The bales tendered are almost up
above, or within one-quarter of strict good middling.
on tendered is actually worth $7.50 per bale more than
its grade, or a difference in value of $7,500. As a
the law and according to grades established, you have
a grade either above or below its actual value, not-
the fact that the cotton is actually worth $7.50 a bale
grade below, which I believe is good middling, and
ss than strict good middling, the grade above.
You want to know what becomes of that spot cotton?
(continuing). On the one grade, the person deliver-
to $7.50; I am inquiring whether any of those cases
your office.

Mr. BRAND. Not unless he raises
[illegible] in the spot market
[illegible] to see whether they
ment.

Mr. HEFLIN. If he raised that q

Mr. BRAND. It sometimes occurs
[illegible]. We found that one of the
[illegible] points off, when other marke
at [illegible] points off. We promptly
[illegible] it to check up the differences
cotton transactions and to determi
cases they have complied, makin
basis.

Mr. HEFLIN. If one party to a c
the exchange board has treated
plaint that there is not that di

between one grade and another, and he desires to appeal
department——
D. He would have no appeal to the department. He
on his rights as a member of the exchange, and he would
l to settle according to the average commercial differ-
d from the spot markets.
EN. But it would not be in your power to settle the dif-
rading it according to law.
MAN. If a seller of cotton should dispute the averages
et from these 11 spot markets and question the accu-
averages, then you would investigate to determine
ot your averages were correct?
. Yes.
MAN. If your averages were correct and you stated they
then the only remedy that he would have as between
ies would be such remedy as the rules of the exchange
he first place; and if he was not satisfied with this, his
l be in the courts of law? Is that it?
. Yes; in the courts of law.
MAN. Is that what you had in mind?
. It would be a matter of contract between the two.
N. I had in mind a situation without regard to the in-
ey had over there as to what the price was in the spot
when a man contracted for the cotton with a man to
tton, and when the time of settlement came he had four
e said, "This is worth 12 cents, this is worth 11, this is
this is worth 8," and the man contracting for the cot-
ere is not that difference in the grades; there is not that
ce. I dispute that proposition." The question I wish
To whom does he go for enforcement of that contract
the exchange does not live up to it?
. If it is a matter of price, he takes refuge in the
exchange and the courts of law, as Mr. Lever says.
reement is one of grade, length of staple, or other
bmits the question to the department, and the depart-
s are prima facie evidence in the courts.
. Under the law?
Under the law.
. When we prepared the Lever cotton-futures act, I
g to do with suggesting that provision of taking that
r department, and it was in my mind that the purpose
at provision was for you to have that power when he
ou. Suppose this man wants me to take this cotton,
at there is this difference between this grade and that
ay "That is not true," and you have got the informa-
spot market price; I want you to use your judgment on
my intention—for you to have that power under that
ave not got that, and he has got to rely on the rules
e, he is in a bad fix on that proposition.
The rules of the exchange provide for using the ma-
is required under the law for arriving at the differ-
what you have in mind is accomplished, though not by
od that you have in mind. It is accomplished through
ercial differences in value in the spot market.

. Or be subjected to the tax of 2 cents a pound?
. Two cents a pound on every contract.
N. They have formulated rules?
We have cooperated with them, and all their rules have in accordance with the act; and, as Mr. Lever said, the the New York Exchange has since stated that they nge these rules if the act was declared unconstitutional.
MAN. Are there any other questions on this? If not, r. Meadows to give us very briefly what he does on the to get these averages.
If I may insert one word in regard to the item of 1, I would like to do so.
IAN. Yes.
In connection with the spot markets I wish to say that red to quote to us daily. This is a gratuitous service onsiderable work and care. They are required to quote on the standards that we have prepared and promul- ower grades of the white standards particularly, and dards, will change with relative rapidity. Inasmuch markets are rendering us a service in furnishing these feel that in their particular cases it would be only fair e replacements of the standards they have purchased necessary to declare these standards as no longer true are 11 of these markets actually reporting at this e are 15 or 16 designated. It is therefore suggested nt to a change in the language of item 41—I believe s "for the investigation and demonstration of stand- ifferent grades, etc., of cotton"—so as to make it read, investigating, demonstrating, and promoting the use etc. Under that language we can extend to these spot urtesy of replacing sets that we condemn because they e enough to permit their use in obtaining, in coopera- uotations in the market. I lay that suggestion before in order that we may be given authority to do that, mittee pleases, I would like to submit a letter from the Agriculture recommending such a change as I have

referred to is as follows:)

DEPARTMENT OF AGRICULTURE,
Washington, February 8, 1916.

ommittee on Agriculture, House of Representatives.

R: For the purposes of the United States cotton-futures act, the bona fide spot markets designated by the Secretary of be based on the official cotton standards of the United States, arriving at the actual commercial differences in settling con- otton for future delivery made on the exchanges.

that the practical forms of the standards which are used for hall always accurately represent the original standards, in esulting quotations may constantly reflect the true values of

e renders these practical forms subject to change and deterio- able that they should be frequently inspected and, from time . The consequent expense to the purchasers is somewhat of ay have a tendency to limit the distribution.

It would seem desirable that authority be given the Secretary of Agr. . to place copies of the standards in the spot markets and on the exchanges to replace them from time to time, in his discretion, free of cost to the pe using them. In this way the use of the standards would be promoted a purposes of the cotton-futures act more completely carried out.

Under the act practical forms of the official cotton standards of the U States may be furnished only on request and payment of the cost th The language of the estimate of the Department of Agriculture for the year 1917 provides "for the investigation and demonstration of stand etc. (See p. 197, Estimates of Appropriations for the Department of A. ture.)

It is believed that the Secretary of Agriculture would be unable to mai desired distribution and replacement free of cost to the spot market exchanges concerned, as the purposes contemplated do not seem to come the grant of authority to demonstrate the standards. Therefore it is sub for your consideration that the item above referred to should be amende striking out the words "the investigation and demonstration" and subs therefor "investigating, demonstrating, and promoting the use."

Very truly yours,

D. F. Hou
Secre

Mr. HEFLIN. What do you charge for those grades that you out?

Mr. BRAND. The complete set of white grades is $20. If yo in your old set of nine boxes it is $15. The color standards a for the set, or $2.50 a box.

Mr. HEFLIN. I thought you had a box with nine grades in it box for all the grades.

Mr. BRAND. No. We are studying that subject in connectio item 41. That is a point that was not brought out yesterd connection with the investigation and demonstration of cotton ards we are trying to devise practical forms of grade standar the county agents and other persons can use in teaching peopl thing regarding the value of their cotton—a simpler form of ards which would be suitable for such use, though not for the trade itself.

Mr. HEFLIN. It would be a good idea; and if you had those ards at a cheaper price, the farmers themselves could buy the

Mr. BRAND. We have devised five or six different metho are carrying on experiments for popularizing the form of the ards.

Mr. HOWELL. How many cases have you been called in to ar on future contracts, this year?

Mr. BRAND. Up to December 1, 1,003 cases, involving 65,5 of cotton.

Mr. HOWELL. So that this appropriation of $60,000 is now f upon us permanently so long as cotton is grown?

Mr. BRAND. I should think, considering the beneficial purp the act, that there would be a continuing appropriation.

Mr. HOWELL. I was inquiring to see if, after the trade ge oughly acquainted with the spot market and the method of d they would not, to a large extent, relieve you of this arbitrati are carrying on.

Mr. BRAND. That is a possibility, but in every case of such a tion they must pay the costs. We have returned to the Tr as a result of this, nearly $24,000 of the sum that has been ap ated for this work; also a sum in excess of $10,000 from the

d a sum in excess of $10,000 from the sale of cotton
ıo longer necessary for the preparation of standards,
$45,000 that we have returned altogether.
L. How do you charge for the settlement of these

We charge 20 cents a bale if only one question is
more if more than one is included.
S. Here is the language of section 6:

or the purposes of section 5 of this act the differences above or
ct price which the receiver shall pay for cotton of grades above
is grade in the settlement of a contract of sale for the future
n shall be determined by the actual commercial differences in

rn it says:

rences above or below the contract price which the receiver
ton above or below the basis grade shall be determined by the
ommercial differences in value.

of those cases been referred to you in determining
ue? At 80 points the difference is $4 on each bale.
e a contract to deliver 1,000 bales to you of a certain
examination I have not 500 bales of that grade, and I
es that are graded at the grade below, but they are
its, or one quarter, of the grade above, which would
rth $3 more than the grade below, or what they are
the question comes up between you and me whether I
the $3, or how much I am entitled to for the extra
t grade. Under the law as an operator on the cotton
entitled to $3 per bale.
enefit that is given to the operators on the cotton
ot to the farmers, and there was some objection to it
that that discriminated in favor of the operator on
rade in giving them the benefit of the difference be-
grades fixed and not to the other people.
Some sections of the cotton trade complain that we
enefit to the exchanges and declined to give it to the
pot merchants; so that we are receiving communica-
ton spinners and others who want us to determine

The law gives the difference between the two.
Yes.
. But what advantage do the cotton operators of the
rom this act? Do they as a general thing get pay for
the cotton?
We pass, as I stated before, upon the true grade, qual-
of staple.
. Then, so far as the price is concerned, they must

Yes.
You grade it, do you not? You fix the grade?
Yes.
For them; but under the law and your ruling it must
r "strict middling" or some other grade established?
Yes.
There are differences in between those grades you fix?

[illegible]

Mr. BRAND. It is determined [illegible]

Mr. HAUGEN. That is true as to the grades, but the differ[illegible]

Mr. BRAND. We take no account of the differences [illegible]

Mr. HAUGEN. And that question has not been submitted to

Mr. BRAND. It will not be submitted to us because the [illegible] requirements require that the cotton must be delivered [illegible] standards of the United States.

Mr. HAUGEN. Have you any knowledge of the operators [illegible] taking advantage of that provision of law?

Mr. BRAND. When you say "taking advantage," I do not understand what you mean.

Mr. HAUGEN. Or benefit: I do not care what you call it.

Mr. BRAND. The trade has been very greatly benefited, we [illegible] of the contract has been considerably enhanced.

Mr. HAUGEN. You are talking about one thing, and I am [illegible] another. If you do not care to answer the question, ver[illegible] I will not press it: let it go.

Mr. BRAND. I am glad to answer any question.

Mr. HAUGEN. I take it you have read the law.

Mr. BRAND. I can almost repeat it from memory.

Mr. HAUGEN. Then you know what the differences are?

Mr. BRAND. Yes.

Mr. HAUGEN. And you know what this language means, or below the basis grade"?

Mr. BRAND. Yes: I think so.

Mr. HAUGEN. And that there is a difference. Now, of what is that to the operator: or what use is made of that by the op[illegible]

Mr. BRAND. Those distinctions are not recognized.

Mr. HAUGEN. Not at all in the trade?

Mr. BRAND. Not at all. Delivery is made in accordance w[illegible] standard. He declares always upon the grade and never t[illegible] the grades.

N. And the cotton is delivered at the price of that par-
?
. At that particular grade.
N. That is all I want to know.
. And each man decides for himself which grade comes
ring him the value which he places on the cotton, and
t that grade. If the other party to the contract does
is getting a square deal, he disputes it and submits it
ment.
EN. Now, when delivering cotton almost up to the
he delivers it at the grade below—no matter what the
?
No. We do not go into that. The trouble is, there,
ive of a possibility that does not exist under the act.
N. The act provides for it.
. No.
MAN. Let me interrupt you, gentlemen. I do not think
re meeting at all. Let me see, Mr. Haugen, if I get
at.
N. Yes.
MAN. Mr. Haugen conceives this situation: Here is a
which grades not quite up to strict middling.
. Yes.
MAN. Within a fraction of strict middling. Here is
of cotton which grades, say one-half way between strict
middling. Now, the question in Mr. Haugen's mind is,
ne to determine the grade, when the dispute is made,
his bale that almost grades into strict middling into
g or do you drop it back to middling?
We put it in strict middling if it is nearest that grade.
MAN. The one that grades a little below the half-way
ou put that into middling cotton and not into strict
s that it, Mr. Haugen?
N. No. That is not what I am getting at. What is the
strict good middling?
Middling.
N. Middling. Now I have a contract with you to de-
nd bales, and I have 500 bales that are strict middling,
ve 500 bales that are not quite strict middling. Con-
must grade them the grade below?
No. We must grade them according to what we find
l put them in the nearest grade.
N. Would you put them in the grade above?
With all the cotton in the contract before us, we try to
where the cotton should go, in order that there may
nest treatment to each of the parties to the contract.
N. First, you fix the standard, and it has got to come
l before it can be graded thus and so?
Yes.
N. Here comes cotton that is not quite up to that stand-
does not come up to that grade it has got to go to the
does it not?
If it is too low for the upper grade it has got to go to
le.

Mr. HAUGEN. Here comes cotton that is better than the [illegible] but not of good enough quality to go into the grad[e]. What do you do with that? You have to grade it down, [no] matter whether you put it in grade above or below, the [difference] still exists. When this cotton is tendered on contract f[or] delivery, under the law the operator can take advantage of [the] difference. If it is three-quarters above the established gra[de] there is $\frac{3}{4}$ difference in the two grades established, he [can] take any of the four. That is the law. Now, the point is, [has] a question been raised before the department? As I understa[nd] simply deal with grades. You do not fix any middle grade.

Mr. BRAND. We deal with grades and differences.

Mr. HAUGEN. What do you do in that case? Here I [have] bales that come within a quarter of the grade above, and t[he] other is $\frac{3}{4}$ a bale. What do you do in that case?

Mr. BRAND. Each contract has 100 bales in it. If the [buyer] disputes the whole 100 bales, and there are slight variation[s] perts in classing consider each bale on its own merits. If [it is] almost strict middling, they will put it into strict middlin[g] and that case, the bale is a little better than middling but [not] enough to go into strict middling, it will go back to middli[ng]. Therefore, when you have completed the examination of [the] 100 bales, if you have been accurate, you have done [both] of the disputants.

Mr. HAUGEN. I am talking about differences and you a[re] about grading.

Mr. BRAND. I am willing to talk about any feature of t[he] that you wish. I am familiar with all of them.

Mr. HAUGEN. But when it comes half way between, wi[th] [what] with that difference?

Mr. BRAND. If all of it has been running high and it has [not] had a good delivery, we may put it up into the next gr[ade] has been running low, and it is a very close margin, we will put it into the next grade below.

Mr. HAUGEN. Have you not a maximum to go by?

Mr. BRAND. We follow our standards. I might go a litt[le] and that might improve our understanding of each other.

Mr. HAUGEN. Very well.

Mr. BRAND. The grade is not a flat surface. There are [12] cubic inches, and those 12 types represent a certain degree [of] tion; so that within them you have an area that has thickn[ess] as surface.

Mr. HAUGEN. You are talking about your grading and I [am] ing about the differences between the grades, and there does [not] to be any distinction between the two.

To make it clear, take wheat. No. 1 wheat is worth [a] bushel.

Mr. STEELE. Stay on cotton.

Mr. HAUGEN. I have thrashed out the cotton proposit[ion] No. 1 wheat is worth a dollar a bushel, and No. 2 wheat is [cents] cents a bushel. But here is a grade that comes within [a] of that No. 1, and, under the rules, unless it comes up to t[he] ard, you must grade it the grade below, because your rule

anything, must provide that this must come up to cer-
ds.
is wheat within one-quarter of No. 1. That has to go
2. The actual value of that wheat is 99 cents a bushel,
ded No. 2, which is worth only 96 cents. This bill pro-
I have entered into a contract for the delivery of No. 1
entitled to the 99 cents.
). As determined in accordance with section 6 of the act
les for the designation of spot markets, whose average
based on spot transactions, above and below the basis
quired to be used. You have in mind a particular qual-
; that involves a specific contract and not a basis contract.
EN. Now, a man gets 99 cents for that wheat because
difference of 4 cents between grades, and his particular
within one-quarter of coming up to the standard; so,
tting 96 cents, he will get 99 cents under the settlement
e terms of this law.
). If it is No. 1 he will get 99 cents, and if it is No. 2 he
ents, if those are the prices of the grades at the time of

EN. But it is neither.
). It can not be. Under the law, in this case there can
between the parties. It must be delivered as one or the
n accordance with the standards.
EN. What does this language mean, then? That is what
says.
). All the quotations in the spot markets are made on the
standards, and the cotton delivered on future contracts
the same standards as the cotton sold in the spot markets.
EN. What does this language mean:

erences above or below the contract price which the receiver shall
above or below the basis grade—

ır No. 2 or No. 1, now—

ined by the average actual commercial differences in value.

actual commercial difference would be three-quarters

). The actual commercial difference must be based on the
at have been established. There is no standard in the
h you are addressing yourself, that is, between the re-
les. There is a quotation from the spot markets for No.
s a quotation for No. 2.
N. Not for one and a half?
). Not for one and a half. The classer has to determine
eign matter and other conditions what grade it is.
EN. I am not talking about classes. I am talking about a
e classer has to class it as No. 1 or No. 2. It is above No.
omes of that difference between it and No. 2?
). In our work we take no account of the differences ex-
n the grades as evidenced by the standards.
EN. Yes; but what do the operators do?
). If they are selling on the spot they get the benefit
differences. If they find a spinner who is after cotton
cular class, they may get a little more; that is, in the

[redacted]

STATEMENT OF M. V. I. MEADOWS, [illegible]
CHARGE OF INVESTIGATIONS IN SPOT [illegible]
OFFICE OF MARKETS AND [illegible]

the matter as succinctly as possible I shall, with your
it all I have to say under two heads—first, the results
already accomplished and, second, what we propose

rst of these heads I wish to state that when the law was
ity was imposed upon the Secretary of Agriculture to
d regulations for the proper enforcement of certain
the act. One of the first steps that was taken was to
the spot markets and to the future exchanges to get
hich would serve as a basis for formulating, in col-
h the Solicitor's office, the rules of the Secretary.
thing we have accomplished is the investigation of the
es in order that their rules might be made to conform
to the rules of the Secretary of Agriculture under the
ecessary to assist in making certain adjustments of the
changes, and it needed men who were familiar with
of the Secretary and the rules of the exchanges in
proper harmony between the two. That is the second
ave accomplished.
ndertaking on our part has been the investigation of
he spot markets of the South. We have visited these
n as it has been necessary and have designated certain
de spot markets under the act. The following cities
s designated: Norfolk, Augusta, Boston, Savannah,
ntgomery, Mobile, Memphis, New Orleans, Houston,
las, Fort Worth, and Little Rock. As a prerequisite
ion of each of these cities, the cotton exchange located
to the following conditions:
would adopt the official cotton standards of the United
; it would quote its market thereon.
would maintain a fairly constituted quotation com-
otations might be correct.
would follow the rules of the Secretary of Agriculture
of quotations.
would supply regularly by wire these quotations to
kets and to the Department of Agriculture.
would otherwise cooperate to the best of its ability
ent of the cotton-futures act.
ds, these exchanges agreed that they would do what
them to do to help us enforce this measure properly.
ndertaking has been the securing each day of quota-
designated spot markets by wire. These telegrams
abled in our office, and a difference sheet has been pre-
the true commercial differences for the day. The
have been compiled by us have served as checks against
differences that are in use in the settlement of future
e Cotton Exchange in New York. I might state that
ams are sent by the spot exchanges to the future ex-
our office here in Washington.
necessary, local conditions in the various spot mar-
investigated by personal visits. Incorrect quotations
hese markets have been corrected from time to time
sion. It has only been necessary to call the attention

s still in operation; the members of the exchange were
re trading in spot cotton, but not in future contracts.
MAN. Bremen is a future market?
ws. It is a future market under normal conditions.
MAN. If Bremen should adopt the contract, as it was
s you hope that she may do, would the complaint as to
a justifiable complaint?
ws. If Bremen had adopted it, that would certainly
l all complaint for any cotton that was shipped to con-
pe, because they could have hedged it in Bremen, which
market on the continent.
N. A little while ago you said something about these
at you obtained in the spot markets to take the place
rcial differences formerly used on the New York Cotton
suppose you meant that these commercial differences
le on the spot markets were to take the place of fixed
ed in the New York Cotton Exchange, did you not?
ws. I did not mean to say exactly what you attribute to
to say that the commercial differences that are imposed
futures act are quoted directly to the cotton exchanges
th. We get identical telegrams and compile that same
ere in Washington, and if there is a discrepancy be-
w York Cotton Exchange differences and ours, we in-
matter immediately and ascertain who is right or

. That is what I mean. Before this Lever act was
ssed, the New York Cotton Exchange used the fixed-
inciple?
ws. Yes; they used fixed differences.
. And we substituted this provision of the law in order
ommercial differences obtain.
ws. Yes.
. And that is what you do now by your work?
ws. Yes. We have the commercial differences now.
. Do you not think that it would be a good idea for you
ese quotation committees at each spot market in the
ted by you to follow up with a letter each week, say-
ed you on Monday and Tuesday that the quotations
follows," so that, if the telegraph operator did make a
ving the figures, you would have these letters mailed
ich nobody would see except you and the operator.
ws. That has been attended to. We have the telegraphic
ned by mail.
. You do that?
ws. Yes. That has been in effect ever since the tele-
e was inaugurated.
IAN. Are there any further questions on what has been
. the next proposition is, what you are going to do.
ws. Yes, what we are going to do now, just as short as

IAN. All right; go ahead, now.
ws. We propose to continue the supervision of spot
otton in order to assure reasonably correct quotations.

STATEMENT OF MR CHARLES J. BRAND. CE
MARKETS AND RURAL ORGANIZAT

MR. BRAND. I can hardly believe that Dr.

MR. BRAND. I have markets.

MR. BRAND. If you said "spot markets" y

MR. BRAND. Yes; I did. I intended to s

MR. BRAND. It can be taken advantage o

ıce is this: The farmer or the shipper sells cotton that
ers above the grade which it is graded, and, the differ-
on the bale between that grade and one above, he receives
value above grade which is $3 a bale. But the fellow
he exchange turns around and delivers that same thou-
a future contract, and he gets the benefit of the $3 a
).

I do not think your conclusion is warranted.

N. Well, that is the law.

Mr. Chairman, I neglected, through oversight, to call
of the committee to the distribution of the grades.
on this map represents 10 sets [indicating on map],
5 sets, and each white pin 1 set, which have been dis-
e office under the law. Nearly 620 sets have been dis-
far. This, in a way, visualizes the very wide distri-
as taken place since the standards were promulgated.

IAN. Where is this set located?

At Minneapolis, and we have a set out in Oakland,
ıere is a cotton mill, and also several sets in the new
ting sections of California and Arizona.

IAN. Is there anything further about this? If not, I
u about the increase. You are providing for an actual
,740 over the amount carried in this item last year?

Yes.

IAN. Briefly tell us why this increase.

That increase is made to replace the sum which is
d this year from the continuing appropriation.

IAN. How much was that?

The original sum was $150,000, and the sum provided
1,500 less than is available this year.

IAN. You had available, therefore, this year $125,000
he act?

No.

IAN. You had a $85,000 allotment plus $75,000 appro-

A year ago last August we had $150,000. Fifty thou-
f that sum was allotted to the work of that fiscal year.
ousand dollars has been allotted to the work of the
year. The sum of $68,740 plus the $1,500 reduction,
to about $70,000; so that we have, as a matter of fact,
bout $1,500 less than we are now using.

. That is for the enforcement of this act.

AN. Is that clear to you gentlemen? Is it clear to you,
?

ON. Not very.

. It is clear to me, Mr. Chairman, that we are appro-
0 to enforce an act which is not in existence.

AN. That is a difference of opinion.

. Some courts have passed on it, and I am against the
ion of this Government enforcing laws that have been
ıstitutional by the courts.

AN. That is a matter of policy.

. It is simply a hold-up, and I do not think it is a wise

AN. There is one other item in the miscellaneous items, e Book of Estimates, item 10, as follows:

Secretary of Agriculture to cooperate with the several States it of agents to acquire and diffuse useful information connected ition and marketing of farm products through investigational, or extension methods, $35,000.

w suggestion?

Yes.

AN. What do you propose to do under that?

The importance of improvement in marketing condi- nited States is recognized by practically every State, eiving weekly most urgent demands from the author- e States to cooperate with them in the investigation ms, in demonstrating better methods, in devising State s, and in all other activities relating to the improve- ting and distribution. It is a kind of activity which rovided for in any other way. Hence this item has in order to take care of it specifically. We have on ioment 16 requests from different States asking for this respect, including Massachusetts, Wisconsin, va, also various southern States and several of the —a total of 16, all desiring cooperative assistance. provide specific authority and funds for such coopera- tes denoted before do not include several with which rking in a preliminary way.

AN. To illustrate, how would your plan work out?

We are trying this matter out in various ways in a Massachusetts we tried the plan of appointing one of he State Agricultural College and of the State exten- In the case of Tennessee we have appointed a man, expense of his salary, travel, and other miscellaneous ge, station, and university paying the other half.

her State, Louisiana (although in this case we are h Mr. Rawl on another matter which will be discussed mittee), we have put in a half-time man, the depart- alf and the other half coming from the State uni- n Rouge, to test out results. This man is stationed e. In Massachusetts the agent mentioned was sta- rst.

f Minnesota a man was employed jointly with the lege and the experiment station and was stationed at ark.

doing the Minnesota work as a test of best methods, e employed is now in Washington digesting the re- y on this work in the States wholly in cooperation authorities.

South Carolina we have a Mr. Hoffman, who is coop- State extension service there in testing out the bring- people of the best marketing methods to use within

ery great lack of information within the States as s and successes in the different parts of the same n devotes himself to the activities within the State, formation in us, and we are thus able to put into

The CHAIRMAN. How many States have been
Mr. BRAND. We count that this is to prov
cooperation in about 25 States. We will exa
of the salaries and half of the expense, as we
should ask Congress to support that whole wo
Mr. ANDERSON. Is there any reason why Co
it at all?
Mr. BRAND. There are some good reasons.
in a wonderful way if these problems can be st
agency so that we shall not have 40 or 50 diffe
in different ways at different places and dupl
and all that. It makes for saving and for effici
Mr. ANDERSON. How is this work attended
Differentiate this with respect to your other
to cooperative organizations.
Mr. BRAND. This would provide particular
within the States who would cooperate with
the Officer of Markets and Rural Organizatio
For instance, Mr. Bassett mentioned specifica
gus. In that instance Mr. Bassett laid the
cooperating State man took up the work fro
Mr. Bassett laid and is carrying out the details
Mr. ANDERSON. Then, the work to be done u
character of field work?
Mr. BRAND. Yes.
Mr. ANDERSON. It is extension work purely
Mr. BRAND. Well, it is both investigation an
carried on through some extension methods.
carry on both investigational work and demo
Mr. HAUGEN. Yesterday we had statements
of creamery products, cattle, hogs, and all o
country. Now, what further information can y

ut a definite limit on what the Federal Government is
the way of extension work.
. I think this $35,000 is a very modest sum for a very
ject, and my own opinion is that as this work develops
ll gradually take it over.
SON. I am afraid it is going to be the other way around,
velops more and more these appropriations will grow
rger, and the part which the Federal Government will
me greater and greater and the part that the State pays
id less.
. I think that is true up to a certain point, but you
point where it is possible to combine Federal activities
tivities, and so far as I am concerned I think it is good
o where possible.
SON. Of course, if it is necessary to have some field
ry on this work of cooperation, that is one proposi-
s not go beyond that; but I take it you intend to go
rther than that.
. My method has been to work a thing out and de-
lutely whether it would pay dividends to go any
we could with that sum, and, if it was not warranted,
it. There are so many important problems that these
dle. At present—and this actually happens—if the
n in the State work needs to know something about
Chicago, usually he has to go there and make the study

f this kind would be developed by an interchange of
and when the Tennessee man wants to know about
Illinois he can get his information immediately with-
expense of going to the neighboring State or the dis-
ithin a week two Arkansas men have come to my office,
to Massachusetts. If we had a well-developed service
an interstate service, which need not be over-expensive
is finally developed—the Arkansas man could get his
from a disinterested and competent source in Massa-
out the expenditure of two or three hundred dollars
twice a year to get it.
SON. In that case how would he do it?
In that case he would do it by correspondence or tele-
e would have a disinterested agency on the same basis
which he could put complete reliance.
. By bettering these marketing methods you benefit the
he consumer, too?
. Absolutely.
EN. I recognize the necessity for the kind of work you
t I do believe that in that work you ought to try to
beyond which you will not go in the matter of demon-
is, that you will not undertake to carry the demonstra-
the individual farmer; that you will carry it to the
ate agencies, but not go beyond that. If you ever go
t will take millions and a greater organization than the
ver figured on.
. I think you have expressed our policy. A request
gesen's own State, from the director of the experiment

N. You do cooperate, but up to the present time, as I
Federal Government is paying a portion of the ex-
be, as is stated here, a small amount. It may be one-
alf, but we are contributing Federal money to State
operation with them. Now, I do not believe that that
tinued very many more years. I believe you ought to
ves to investigational work and give the other work
ate machinery. All the States have their colleges of
l experiment stations, and the various States ought to
l do their own work in the States.
I think this proposition is very much in line with
ss.
And we have that information where anybody in the
an get it by writing for it.
N. Each State has its peculiar situation to deal with,
ifferent from the other, and each State has a piece of
in its own borders to look after its peculiar interests.
o interest at all in the information in which you are
ur State, and you would not have any interest in mine.
eral Government furnishes to your State the informa-
for your people and to my State the information
y people, I would not write to Washington at all; I
the agricultural college and the experiment station
want; and if you draw the line there you will have
dreds and perhaps thousands of Federal agents who
d be covering the country and doing what the States
mselves.
Mr. Chairman, this has gone in the record, I think.
t do any harm to have it in again.
ite a complete organization for dealing with the mar-
hable products—peaches, melons, and cantaloups, etc.
o with that force after the season is over?
We have built that force up, Mr. Howell, on the basis
succeed each other on the market. It is merely an

A man who is expert in one line is expert in all?
The work in perishable products has been an experi-
lly all of these are handled by the same group of men.
ged that they should look after the strawberries which
and April, then cantaloupes which come on later,
that we have had only a small force, considering the
ducts and the seasons that they cover.
Those men are employed during the entire year?
Yes, indeed, they are.
. What are they employed on after the shipping sea-

There are about three months left, and I never saw a
work harder trying to get the data secured during the
on worked into form for publication as a basis for the
ork. In fact, the perishable-product season is on us
ve not been able to get these data worked up.
AN. If that is all, we are much obliged to you.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Monday, February 14, 1916.

ee met at 10 o'clock a. m., Hon. Asbury F. Lever siding.

T OF MR. C. L. MARLATT, CHAIRMAN OF THE FEDERAL HORTICULTURAL BOARD.

AN. The next item is on page 206 of the Book of Esti-ies, Federal Horticultural Board." I will ask Mr. ain this item. First, we will take up your statutory ur first statutory roll?

. Yes. This is our first statutory roll.

AN. In view of that fact, let me ask you this question: nsfers have been made from your lump fund?

. All of the transfers have been made from the lump

AN. At the same salary?

. At the same salary.

AN. And the lump fund has been reduced accord-

r. The lump fund has been reduced by the same

. These salaries were fixed in the lump fund?

. The various clerks, stenographers, etc., were taken furnished by the Civil Service Commission.

. They correspond to the other employees who have is in other branches of the Department of Agricul-t?

. I think so.

. Do the salaries compare favorably with the other r are they higher?

. They are lower, if anything.

. It has been running in my mind all along that if ople from the lump fund and put them on the statu- that we have control of the amount they receive, but made inquiries as to whether the amounts are too low

AN. I would say I have asked the department to fur- personal use (and if it will be of any service to this ill have the information put in the record) a state- the comparative salaries paid, running through the technical bureaus in the entire Government service. ave seen in that statement already, I find the salaries

The pink boll worm is an enemy of cotton very respects, in the form of the damage it does to the is country. It is a larva—a moth larva—which feeds he start of its career. Then it goes to the square and ultimately it infests the young boll and destroys the boll weevil does. It goes further, however, and r in the seed, eating out the contents of the seed. herefore, to the cotton is comparable to that of the lestroys the squares and the bolls, but it goes further seed. The work on the seed alone in Egypt, where ıly been present a few years, has already decreased of oil 20 per cent and has reduced the yield of the 20 to 50 per cent.

How are you going to detect them in bales of cotton t into this country?

That is where the cost comes in. We are attempt- ıe entry of the insect in such cotton.

tates is the only country in the world where cotton extent in which this insect does not occur. It has Egypt, to South Africa, and to the Hawaiian it has put the small but growing cotton business f existence—and it has even reached China. Fortu- as not gotten foothold in the United States.

hich we are exercising in order to keep it out of this We have had for two years a prohibition against the seed from foreign countries, except from a few con- f Mexico where the production is continuous with r or lint is imported in considerable quantity for spe- s, and these importations involve both the best and les. It was at first thought that there was no risk in of such cotton lint, but it was later discovered that best quality of the Egyptian lint some several hun- ry bale of cotton, and live larvæ were found in such eds and insects were obtained from the seeds elimi- ration of cleaning at the mills, and demonstrated the entry of the insect by this means.

necessary to bring under regulation and control the eign cotton, or else exclude such cotton altogether. to do would be to exclude it, and that would not . But in order to safeguard the entry it was neces- eans that would kill the larvæ in the bale or prevent development.

subject, and, in the first instance, we got a gentle- with all the mills using this cotton throughout the burn all the seed and waste coming from the cotton at the mills and to screen the rooms in which the led. This action was taken by the mills, or such of o do it did it, and practically all of them did it.

Were there any exceptions?

Yes; there were a good many exceptions. Under quently issued bringing cotton under regulation we these mills—as a condition of receiving a license to

under a pressure of about 1,700 pounds to the s
any poison into a mass of cotton like that see
impossibility. Nevertheless, we concluded we
The outside is not so hard as the inside, a
could get down into the bale an inch or two th
escape of the insects during transit and whil
storage, because the insects could not bore o
greater than two or three inches.
With this idea of partial or superficial killin
started, using hydrocyanic-acid gas. We de
known as the vacuum system. The bale is plac
all the air is removed and the gas allowed to re
this condition the gas has a tremendous penet
fill the vacuum. I supposed we would get a
Five Times. Ordinarily, if you fumigate a ba
you might not get a penetration of more tha
found we could put the gas into the very cent
vacuum system, and this was proved by a seri
experiments.
Insects were placed in the middle of the bale
and the only means by which the gas could g
through the middle of the bale through minute
ends of the tubes. Chemically treated papers
these tubes, and the gas entered through the s
had its chemical effect on the papers just at th
side.
These experiments we repeated many times
making provisions for such fumigation of all
the United States.
Mr. HAWLEY. Where is the cotton to be fumig
Mr. MARLATT. At the port of landing.
Mr. HAWLEY. At whose expense?
Mr. MARLATT. At the expense of the import

are capitalized at some half million dollars and will
plants for the killing of insects that the world has
e cylinders in which they will fumigate the cotton
00 to 150 feet long and about 9 feet in diameter, and
m 50 to 100 bales of cotton at once. Fumigation is
imately cost about $1 a bale. The first charge will
we have no control over these charges. A large charge
utset because large outlays have been necessitated, and
feel uncertain as to the continuance of the work and
t of their money back within a year or two.
AN. What do you do in the way of protecting the
rom the worm?
. The importation of seed is prohibited, except such
n with the cotton lint. This work is all new. The
to go into effect on February 1, but the fumigation
ready at that date. I was advised last night that these
e ready for a preliminary test to-day or to-morrow,
the fumigation will begin on the 16th of this month.
AN. You say nine-tenths of the imported cotton comes
Boston?
. Yes.
AN. At what other ports is cotton imported? Is it
vannah and Charleston?
. The balance comes in chiefly at New York and San
ere is very little of it that comes in at the southern
t of fact, we purpose not to allow any of this cotton
uthern ports because of the risk. There is very little
ne in.
AN. Do you propose to have this same system of
he other ports?
r. Yes. Two plants are under way in or near New
ivate plant and the other a public plant—and a plant
eted at San Francisco.
. You are going to prohibit cotton from coming in at
these three ports?
. Except where it can be fumigated, and entry is con-
ermit system. Cotton will be permitted entry only at
ere are fumigation plants, and we do not propose to
ny southern port where such cotton would be handled
ton fields. That will be no hardship, because practi-
is imported at such southern ports.
How can they afford to import cotton where it costs
for fumigation?
r. It does not cost that much. It only costs about
1 cent a pound.
. Your men will be at each of these plants to see that
e right amount of hydrocyanic-acid gas and all that

r. Yes. These plants are elaborate, technically con-
and must handle vast quantities of this gas and safe-
llecting the residue and disposing of it in a safe way.
has been worked out in great detail in cooperation
ment, which has approved all the plans and specifica-

r. About $25,000,000 or $30,000,000 worth of Egyptian
on.
r. You stated here that about 200,000 bales are im-

r. About $30,000,000 worth of Egyptian, Chinese and
n—some 200,000 bales.
Can we not raise that cotton here?
r. We can, perfectly well. The cotton imported repre-
nes. The cheapest cottons imported are various classes
for use in the manufacture of explosives, mattresses,
er grades of Egyptian cotton are imported for special
purposes. The Egyptian lint cotton is supposed to
the manufacture of motor-tire fabrics and most of the
n goes into such fabrics.
ry much surprised and rather disconcerted to learn
six weeks that there were other kinds of cotton im-
tton lint, namely, the cotton waste of England. This
he cleanings, in other words—is now being imported
ry in enormous quantities, and the safeguarding of
oing to add a good deal to the expense and difficulty
on of the cotton-entry regulations.
. They have just recently done that?
. The entry of waste has been going on for some time,
orders for waste for use in the manufacture of muni-
ised the demand in this country, and the waste is also
for the manufacture of felts and low-grade mattresses.
. Does England get her cotton waste which comes
cotton infested with the pink boll worm?
. England is the great market for Indian and Egyp-
is also a great market for our own cotton, and the
ick is a mixture of the waste from Indian, Egyptian,
otton.
. You propose to fumigate that?
. We are going to give such waste a stronger dosage.
re dangerous than cotton, because a single bale of
ain the seed that has been taken out of a great many
We are going to fumigate waste at the top strength—
h we are convinced will destroy all life in the bale.
. I wish to say that this waste has a much wider dis-
the lint cotton. Most of the lint cotton is used in the
s—north of the cotton belt. There are less than a
using the foreign cotton in the South, but the waste
he United States and to many places in the South.
ge number of mills which use these imports of waste.
such mills than legitimate cotton mills. All of these
trolled in regard to screening and the burning of

. How do you propose to inspect them?
r. Inspectors will visit the mills from time to time.
the waste are not issued until the mills have complied
nditions, and the inspector visits them once or twice
e use or the assistance of the State collaborators we
iem more frequently and keep a more certain control
at way.

Would you like to have a general statement
we are doing in connection with plant
The CHAIRMAN. A general statement is
Mr. MARLATT. The plant quarantine act g
riculture power to control the entry of f
to prohibit or to regulate the entry and
quarantines to prevent the local spread
recently established pests.

The foreign control of plant entry is accom
One is by prohibition. This control is very
prohibited entry, and control is effected through
the customs offices, and the cost to the Depart
practically nothing, or is a very negligible super

Such prohibitions of the entry of foreign pro
by our prohibition of the potato from all of th
affected by the potato wart; the prohibition of
have just discussed; the prohibition of the entry
of pine from Europe and Asia, on account of
and the prohibition of the entry of Indian corn f
and southern Asia and the islands of that regi
account of a maize or corn disease. This maiz
discovery of our pathologists. It is a disease w
disastrous to our corn crop if it should come to
hibition amounts to very little as a commercial
practically nothing but experimental importati
those countries, but it is a very necessary prohibi

There are several other minor prohibitions of t
hibit the entry of sugar cane in order to keep o
eases, and we prohibit the entry of certain fruits
tries on account of fruit flies.

These quarantines are administered through th
with such examination at the port of entry as

ler what is called regulation, and thereafter it can not
under conditions laid down. These conditions may in-
it to import, foreign certification, and such reexamina-
is may be necessary. Illustrations of plants which enter
ion are nursery stock and potatoes.
advantage of this control by regulation is the foreign
which fixes the responsibility on some definite foreign
n the case of nursery stock has worked wonders.
enactment of the plant-quarantine act nursery stock
to this country covered with dangerous insect pests.
gg masses of brown-tail moth were found in a single
w York. Now such nests are rarely found. Two or
egg masses are now reported annually, as against thou-
ly. All the foreign countries desiring to ship to the
have been compelled to legislate and appoint inspec-
o examine and certify that the nursery stock is free
n. Some 28 foreign countries have legislated as the re-
ederal legislation and have appointed officers and are
ursery stock and other plants under certification.
not entirely eliminate the necessity of examination at
ntry. Ultimately, in view of our discovery in relation
of cotton, we may require the fumigation of all im-
That would simplify matters and would give more
e safety to the country.
Y. Would you have that fumigated here or abroad?
T. Here; just as the cotton is fumigated here. The old
amination at port of entry on the part of the nursery-
it would be necessary to open packages at the dock,
red that the plants would be killed.
vacuum system of fumigation the crated nursery stock
d unopened in one of these big tubes and fumigated in
es at one time. The penetrative power of the gas in
d easily reach the center of any package of nursery
y in a year or two that policy will probably be adopted.
MAN. Now, Doctor, I wish you would tell us about
quarantines.
TT. The domestic quarantines are established, as I
cated, to control the further spread of any dangerous
sease, or insect, which has gotten a local foothold in
They are administered very much on the same system
regulations. In other words, the quarantine is de-
e articles are not allowed to move out of the quaran-
until they have been inspected and certified by us as
ey move under permit only. Occasionally the move-
is prohibited, but in most cases the domestic quaran-
antines by regulation, where the movement is permit-
er inspection or disinfection. There are now four of
quarantines.
MAN. That gives a pretty good idea of the domestic-
stem. It is the same as in the case of the foreign
is domestic and not foreign.
ou to tell us about the potato quarantine. We carried
em for an appropriation of $100,000 for the domestic

w, in view of the cotton importations and regulation of
ls, is the least we can possibly work on.
ant to call attention to that condition and to say, as I
ormer years, that if you give us the money now estimated
end any more than we need. We have turned back con-
s to the Treasury up to this present year. We will turn
ited States Treasury $80,000 of our potato fund of
e want the money to give the proper protection against
it the money will not be spent unless it is necessary.
e a brief statement which puts the general work of the
ticultural Board somewhat more logically, perhaps,
n this discussion.
MAN. That may be put into the record.
nent referred to follows:)

TEMENT OF THE WORK OF THE FEDERAL HORTICULTURAL BOARD.

912, known as the Federal plant-quarantine act, briefly stated,
Secretary of Agriculture, in accordance with the need, either to
egulate the importation of nursery stock and other plants and
to prevent entry of new pests, and to establish and maintain
ntine districts to prevent the further spread of diseases and
hin the United States.
gnizes the peculiar Constitution of the United States and divides
etween the Federal Government and the State authorities. Ex-
and plants under specific Federal quarantine it gives no control
tate or local movement of plants or plant products, nor does it
s under which exterminative or cleaning-up work can be done.
erstate movement of plants not under Federal quarantine, the
of plants within the State, and local control are left to the

cated, the control over imported plants and plant products is of
ely, control by regulation and control by prohibition.
ohibition aims to exclude altogether any plants or plant products
easily or satisfactorily be otherwise safeguarded, and under our
ms control such prohibition is administered through the coopera-
oms office of the Treasury Department with the Department of
h practically no difficulty or cost.
; plants and plant products have been prohibited entry into the

or Irish potato from various foreign countries on account of the

rom all foreign countries and localities, except certain neighbor-
exico, on account of the pink boll worm.
avocado or alligator pear from Mexico and Central America on
vocado weevil.
related fruits from Mexico on account of the Mexican fruit fly.
y stock from all foreign countries on account of the citrus canker
rous citrus pests.
of sugar cane from all foreign countries on account of various
sect pests of this plant.
rom Java, India, and Oceania, except Australia and New Zea-
t of a very serious corn disease known to occur in that general

n Europe and all five-leafed pines from Asia on account of the
er rust as to five-leafed pines and the pine-shoot moth as to all

gulation may apply to any of the plants and plant products
e the ordinary commercial trade between foreign countries and
es. This control need be exercised only in relation to such of
d plant products as may require inspection or disinfection to
ry of known pests. The important plants and plant products
hich is now under regulation are nursery stock, potatoes, and
y other plant or plant product can be brought under regula-
d therefor arise.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Saturday, February 12, 1916.

ınsaction of other business.)

OF DR. J. K. HAYWOOD, CHAIRMAN OF THE SECTICIDE AND FUNGICIDE BOARD.

N. Dr. Haywood, I wish you would take up first roll, on page 203 of the Book of Estimates. This you have estimated for a statutory roll?
D. Yes, sir.
N. I notice that that total is $24,590. Of course, of these are transferred from your lump fund?
D. Absolutely, and at the same salaries.
N. And your lump fund has been reduced?
D. By just that amount.
N. Are there any questions on that matter of the I have looked it over somewhat. It is not very

N. There is an actual increase in your lump fund?
D. The increase for the whole work, including both statutory roll, is $10,260.
N. Are there any questions on that?
D. But there are absolutely no increases represented y salaries. I mean by that, that the men are trans- ame salaries they are now receiving on the lump-

N. How much will this increase be in the clerical

D. Probably none. We may have to get one extra think that will be necessary, though. The increase ed in other lines of work, which I will describe to you

N. Suppose you go ahead and tell us just what you t; and when you have done that, then tell us for what nt the increase and how you propose to use it.
D. Gentlemen, the insecticide act of 1910, as you all t to govern the shipment in interstate commerce of l fungicides and prevent their adulteration and mis- to prevent the importation of adulterated insecticides into this country. In carrying out this act our ideal insecticide and fungicide that appears on the market ement on its label true, up to the standard claimed and corresponding to the analysis given for it on its ed by the law. We perhaps never will reach quite we have been having very good success, especially of the agricultural insecticides and fungicides.

You will be interested, perhaps, in knowing just what we h
able to do along the lines of certain insecticides and fungic
ing the five years that this law has been in force.

When this law went into effect, the first year we found
lead arsenates that were on the market were adulterated
branded to the extent of 60 per cent. The second year tha
tion was reduced to 30 per cent, and the third year it was
to 20 per cent. This last year, the figures for which I have
piled as yet, I think will show the reduction still more.

For Paris greens, the first year 28 per cent of those on th
were adulterated or misbranded, or both; the second year
cent, the third year, 19 per cent. The figures for the fou
have not yet been compiled.

Of lime-sulphur solutions, 94 per cent were found to be ad
misbranded, or both, the first year; the second year, 86
and the third year, 27 per cent.

Of Bordeaux mixtures and certain brands of insecti
fungicides containing Bordeaux mixture, the first year
adulterated, misbranded, or both, 98 per cent; the second
per cent; and the third year, 49 per cent. The fourth ye
lower, but the actual figures are not yet compiled. So yo
that during the five years the law has been in effect we
excellent results in reducing the misbranding and adulte
insecticides and fungicides.

Now, you want to know what this means to the consum
man who buys insecticides and fungicides. It does not sim
that that party is protected by being saved the price that
pay for an insecticide or fungicide. That is a small matte
appropriations you give each year would hardly be justi
only succeeded in keeping a man from being cheated o
with an inferior or worthless insecticide or fungicide. Wha
do here is not only to keep a man from being cheated on the
or fungicide he buys, but we actually have caused the i
and fungicides to be up to that standard and do what is c
them. Therefore, when a man at present buys insecticide o
he can feel reasonably certain that it will do what is claim
that it is up to the standard.

What does that result in? It meant before this law went
that a man would buy his Bordeaux mixture, his lead arsen
Paris green, or whatever it might be, and, upon using them
find them to be not up to the standard claimed on the lab
adulterated, and the consequence would be that he would
his insects or his plant diseases. As a result, not only would
suffer the loss of what he paid for those products, but he
suffer the loss of his orchard or his fruit, his vegetables or
losses dependent upon these diseases or insects that were not
because of these insecticides or fungicides not being up to th
as they should have been.

Further than that, there is a provision in the law which
to proceed against the manufacturer who, while recommen
insecticide or fungicide for use upon vegetation to contr
insects or fungi that infest that vegetation, at the same ti
product which injures the vegetation. That is not theoret
Many of the insecticides and fungicides that you place
tion might do, and have in the past done, more injury tha

same time that they killed the insects they either
es or seriously injured them. Now, the insecticides or
t are going on the market to a large extent do not do
ve reduced that to a very large extent. In fact, I
justified the money you have given us to carry on

EN. Now, the question is, have you? I think this is
same criticism that has been made of the unnecessary
work. We have got agricultural colleges in every
emists fully able to take care of that. In my State
agricultural college, with a competent chemist. We
it penalizes every man who sells anything adulterated.
e did not have such a law, we would still buy these
d fungicides subject to analysis; and if it was not right
or them. What have we got this chemist for if it is
efit of the people in the State, and why should we have
overnment do this work when we have an institution
do that very thing?

OD. I will answer that by saying that, first of all, the
ur State can only prosecute the manufacturer who
and sells within that State. It can not prosecute the
who ships from outside and sells misbranded goods
tate.

EN. Yes; but we can get after the dealer, and the
e good care that he will not sell anything he can be

OD. That is not always true. The dealer is often
manufacturer from the other State, and it is to protect
nst the illegitimate goods of another that a national
l.

that true but only about seven or eight States have
s, and we are protecting the citizens of all of those
at do not have any insecticide laws whatsoever.

EN. Then the States that have laws have got to con-
to help enforce the law in those States that have not
ough to have a law, and I do not see why that should

OD. That is, of course, an objection you could urge
gulatory act of the Government, such as the food-and-
meat-inspection act, etc.

EN. No. There are some things necessary to be done
Government; but those things such as you speak of,
seemed to me, were things that should take care of

OD. I do not quite follow you there.

AN. Your chief answer is that you did not write the

EN. I understand that. I am not finding fault with
k. I understand you are doing the work as carefully
tiously as anybody, but what we are here for is to find
ese appropriations are necessary.

. Would not your criticism apply equally to the pure

D. It is written on similar lines.

ıg that is being worked on by the Government at the
-the most important scientific advance that is being
resent time—is along the line of prevention of disease.
nain methods of prevention of disease is by the use of
-in other words, substances which will kill disease
ı are going to kill the disease germs you must have
hat will do it. You will be surprised, possibly, to
he small study we have been able to make of this sub-
have an insufficient appropriation to make an adequate
we have found that many of the disinfectants that are
have not a single thing in them that disinfects. The
e buried in them and they still survive.

EN. Have you any authority under this or any other
make it possible for you to prevent the manufacture
of those disinfectants?

ID. Yes, sir; we can seize the shipment just as soon
ıe State line and keep it from reaching the consumer.
done in many cases.

EN. What do you do in the way of advertising to the
ters of those things—the manufacturers?

ID. We prosecute the manufacturer under the act,
e of the whole thing, and send out thousands of copies

EN. Yet you say these manufacturers are continuing
e or less all the time?

ID. It is getting less and less, but still they are doing
ıfacturers are starting up; and the old manufacturers
want to obey the law, and they do not always obey it.
under this law put a manufacturer out of business,
ıuld seize every shipment of goods that went across a

EN. Do you do that?

ID. We have not put any manufacturers out of busi-
t we have gotten many of them with the fear of the
nds, so that they are obeying the law in every way at
me. Others are obeying it because they believe in
ınt its protection.

EN. My experience and my observation have been that
such laws deal more severely with violations than does
iovernment; but the big manufacturers—the heavy
combined and brought such pressure to bear on the
wn here that instead of putting these manufacturers
s they say to them, "We have caught you this time,
it again." And with that kind of a deal they simply
e of being caught a second, a third, and even a fourth

ID. I can only say, sir, that it has not been our expe-
ıe act. We went right after them as soon as the act
t, and we have found that the big manufacturers come
ɔey the law usually quicker than the small manufac-

EN. That may be true, and yet you remember the
ıd many others.

ID. I know nothing about that.

as strong as carbolic acid no result would have been
ise it was only two times as strong as carbolic acid.
rious seizures of that kind which we have made, but
you examples of the kind of work we are doing.
N. I do not want to take up much time, Mr. Chair-
is a thing that occurs to me now. They undoubt-
t they can under the laws under which they are oper-
r your experience with these things, would it not be
u to suggest to Congress some method by which you
h them more effectively? We do not always know;
not always know. You have the experience, and if
he present law is not sufficiently effective it seems to
your duty not only to enforce the law as best you
ggest improvements of that law that would make it
l to do better work than you are doing.
D. I think you are absolutely right, and I am turning
d some suggestions to make to the Secretary.
EN. I wish there could be some way of having such
that made to Congress instead of to the department.
AN. Are there any further questions? Have you com-
tement, Dr. Haywood?
D. I was going on to say that one of the most import-
novements at the present time is the prevention of
isinfectants are used for the purpose of preventing
ordinary large city, like Washington, has a health con-
takes care of such matters, but the small-town citizen,
d the general householder do not have any method of
ainst communicable diseases except through the use of
ts which they buy, and it is extremely important that
should be up to the standard claimed, that the state-
abel should be true, and that they should contain sub-
disinfect.
nd that the opposite of all of this is true in case of many
tants on the market. Therefore, we are asking for an
appropriation of $10,260. This increase will be used
ment of the law in so far as it applies to disinfectants
, and to some extent to take care of the greater number
and fungicides that are appearing on the market every
ar Congress gave us an increase of only $5,000, which
ient to provide for the employment of two new inspec-
eir traveling expenses and the purchase of the samples
eded to buy. It was not enough to permit us to in-
entific force at all to take care of the extra samples
uch inspectors. We are getting behind. We can not
e samples which our inspectors bring us at the present
d some of this $10,000 for that, but we need it mainly
he work on disinfectants which we can not take care of
sent appropriation.
AN. Are there any other questions, gentlemen?
SON. Just a question or two. I notice you have pro-
e or two in the language of this appropriation.
OD. What is the change?
SON. For instance, you use the words "For enabling the
stead of the words "To enable the Secretary." Has

there been any decision of the
you to propose a change of t
Dr. HAYWOOD. In so far as
Mr. Harrison, who is present,
Mr. HARRISON. It really do
that the original language ba
Mr. ANDERSON. I do not
using the wording you propo
Mr. HOWELL. It seems to
you are carrying on, that an
custom, by placing this work
the enforcement of the pure-
an economy could be effecte
that involved in the enforce
in the same bureau?
Dr. HAYWOOD. I may say
should be enforced by any
because what we have to do
have the chemist to examine
plant pathologist must test
diseases. The entomologist
be effective against insects,
whether the products will pe
fumants; and, finally, the vet
products as are used in th
believe that in the interests
bureaus involved to do that
of a central board than it wo
bureau. For example, you w
to work in the Bureau of Ch
Mr. HOWELL. That is also
used in the Bureau of Chem
Dr. HAYWOOD. No; you
veterinarian there. You ne
the plant-pathological and
very important parts of it,
and four bureaus working in
the combined action of the
and all the knowledge of th
points.
Mr. HOWELL. My thought
from the pure-food bureau w
ouies just the same as unsle
Dr. HAYWOOD. I think wh
than lost in the other ways
of Chemistry inspectors are
would not be able to unlock
The CHAIRMAN. Is there
Dr. HAYWOOD. No, sir.
The CHAIRMAN. If there
obliged to you, and we will
(Thereupon, at 5.30 p. m.
day, February 16, at 10 o'cl

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Monday, February 14, 1916.

transaction of other business.)

OF MR. F. D. FARRELL, AGRICULTURIST IN CHARGE STRATIONS ON RECLAMATION PROJECTS, BUREAU NDUSTRY.

MAN. Now, we will turn to page 211 of the Book of I take item No. 1 on that page, "Demonstrations on rojects: To enable the Secretary of Agriculture to en- aid in the agricultural development of the Govern- tion projects; to assist, through demonstrations, ad- other ways, settlers on the projects; and for the em- persons and means necessary in the city of Washing- here, $40,000."

, you have that matter in charge, and we would like riefly in regard to it.

. This item, Mr. Chairman, which is headed "Demon- eclamation projects," is the work which is prosecuted ose of developing a rational and economically sound the reclamation projects. It differs from other dem- ork which the department is doing in that this work ly to the debtors of the Government, the settlers on , and is the result, I may say, as you will recollect, of m the Department of the Interior to the Department of o assist in getting farming started on a profitable basis ie difficulties that were being encountered by settlers, erienced, who had taken up these lands.

Y. It is wider than that, I think. There are on every project a number of people who already own their land, hey would benefit by this work.

. All who are in any way concerned with the Govern- tion projects are equally benefited, and the work was or the reason I have indicated.

nsibility for this work, in distinction from general n work, rests with the department almost exclusively, rmal and effective cooperative relations are maintained te agencies of the States in which the projects are

o increase requested here, but I am sure you will be a somewhat more detailed outline of the work from Mr. has direct personal charge of it.

to assist the farmers in establishing the swine industry.
s started in the midsummer of 1914. Since that time
ulation has increased from about 14,000 to about 24,000.
n was stationed on the project, he found an epidemic
a. In combatting this disease he assisted the farmers
out 5,000 head of hogs, of which about 84 per cent were

cording to the reports which have been received, the
breaks of hog cholera was reduced from 83 to 29, and
f hogs which it was necessary to treat was reduced
,000 to about 1,100. The losses of the treated hogs
n 16 per cent to 12 per cent.
al work on that particular project has been cholera
ince the disease is pretty well under control now, our
ven toward improvement in marketing, feeding, breed-
important features affecting the industry.
ckee-Carson project, in Nevada, where our work was
ober, 1914, our attention has been directed almost exclu-
development of the dairy industry. When our man
ere he found that the farmers had very little live stock
had more alfalfa than they could sell. In the spring
till had on hand 50 per cent of the 1914 crop.
rough our efforts and through the efforts of public-
in Nevada who have furnished capital to the farmers
ase of dairy cattle, the dairy-cattle population of the
on project has increased during the last eighteen months
cent. There is now enough live stock on the project to
ne forage crops produced last year.

MAN. Are you working in cooperation with the Dairy
ne Bureau of Animal Industry.

L. Yes, sir. We cooperate with everybody who can help
e cooperated with the Dairy Division and with the
andry Division of the Bureau of Animal Industry.

MAN. The Dairy Division works out the scientific prob-
take up the other problems?

LL. Yes. They also have specialists who are not con-
mation projects, as we are, and we get a great deal of
m them.
ve said about these two projects describes in a general
re of our work. Unless it is desired that I go into more
the other projects on which we have worked I will not
further time on that.

MAN. How many of these projects are there?

LL. There are 26 in all. We have begun work on nine
his takes up all our funds, and these nine represent
ly half the population of all 26 projects. We have gone
jects where the social and economic needs have been
where the opportunities for being helpful have been

RMAN. How large a population is involved in these 26

LL. Something over 18,000 farms are now in operation
jects.

F MR. B. H. RAWL, CHIEF OF THE DAIRY DIVISION, BUREAU OF ANIMAL INDUSTRY.

AN. The next item is found on page 212 in the Book

Secretary of Agriculture, in cooperation with the authorities cerned, or with individuals, to make such investigations and s may be necessary in connection with the development of tion in the cane-sugar and cotton districts of the United the erection of barns and other necessary buildings, and the ersons and means in the city of Washington and elsewhere,

change in the appropriation. Dr. Taylor, I believe hing to do with that item.

Mr. Chairman, this item is one that is now in its nder which this special type of combined investiga- nstration work is being prosecuted, with particular e cane-sugar territory. The only change in the para- ecommended this year is the elimination of the clause erted last year to make available $7,500 of the then priation for buildings that were needed. That lan- ow required, and the paragraph as it remains would at is contemplated to be done.

jects are found on pages 434 and 435 of the Program e work, in view of its interbureau character, par- start, is administered by a committee consisting of ie Bureau of Plant Industry, the Chief of the Dairy Bureau of Animal Industry, and the director of the eriment Station, the work being located in that State. personally administered the details of the work, and it with you.

AN. Mr. Rawl, I wish you would tell us what you are t you hope to do in this work.

Mr. Chairman, the funds for the two projects have s follows: Last year $47,000 was used for the farm nder for educational work. This year $40,000 was m and the remaining $20,000 for educational work.

nsists of 500 acres, donated by the State. It has been sections—1 devoted to beef-cattle problems, 1 to l to horse and mule problems, and 1 to dairy problems.

you will remember, there was no provision for build- Ir. Taylor has just suggested, language was inserted tained in the 1916 appropriation act, making available ting buildings $7,500 of the amount provided in the act for 1915. This language is stricken out of the considered. However, the item as it now stands pro- to continue the erection of such buildings as may be

this farm $20,000 has been used in erecting build- isists of three cottages, an office building, a horse barn, barns, one hog feed house, several hog cots, a small l six cottages for the laborers.

o too much detail, Mr. Chairman, I wish you would I shall be glad to give you all the details you desire.

The [illegible] Tell us what you think we ought to [illegible] regard to this proposition.

Mr. R. W. [illegible] relates only to the [illegible] progress of the work.

In regard to the beef-cattle work there are at least two phases. The first relates to the manner of producing in those climate and soil conditions. The idea is to maintain a breeding herd of cattle as large as possible on grass and cheapest of the cheapest feed available to see whether feeders of [illegible] forage can be raised profitably.

The next phase of this subject is the question of finishing for market. In that region there is a great deal of waste [illegible] for this purpose, such, for example, as sugar-cane bagasse from the sugar factories, etc. Other feeds can be grown [illegible] cheapest feeds [illegible] hundred head of cattle [illegible] test out the value of these various feeds [illegible]

[illegible] the first and second phases of the beef proposition [illegible] can be raised and whether they can be finished.

The work on the horse problem will include only the [illegible] farm. The idea is to [illegible] mares [illegible] worked in the fields in that climate and [illegible] mare foals. The mares are doing as much [illegible] A record is kept of the amount [illegible] consume, and the feed which the [illegible] with similar records of six mules. [illegible] the work of the mare plus the [illegible] keeping of mares under such conditions. [illegible] charged to the different branches of the [illegible] are kept separate.

[illegible] problem there will be [illegible] whether or not the mules raised [illegible] necessary vitality and vigor.

[illegible] to the beef-cattle project. [illegible] selection work, some of which [illegible] The hogs are divided into groups, [illegible] distinct rotation of crops for the [illegible] of these crops is of greatest value [illegible] The crops are supplemented to [illegible] products, such as black-strap molasses [illegible] selected from a commercial or [illegible] exact, scientific one. We [illegible] possibilities of live-stock projects [illegible]

[illegible] not yet been completed. It [illegible] contain a small herd of [illegible] It is proposed to use the [illegible] supplementing them with such feed [illegible]

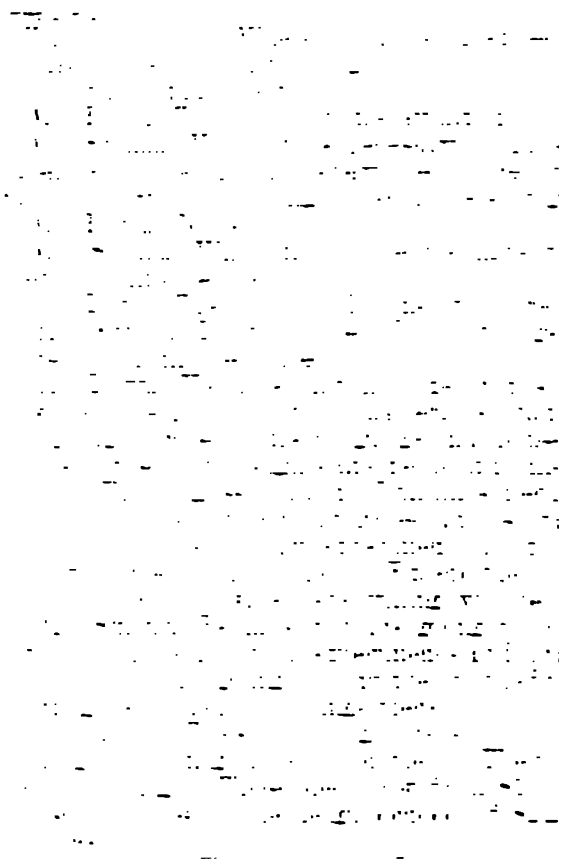
[illegible] hogs we shall need three or [illegible] all practically complete, for [illegible] hogs that will be required.

gional proposition, dealing with the live-stock ques-
ommercial standpoint; and, incidentally, some studies
e by other department branches which are interested
crops. I think that covers, in a general way, the
arm.
ng part of the work is educational. Specialists work
nstration agents to relieve conditions which have been
for a number of years, especially during the two years
s work has replaced a part of the live-stock work done
partment before this work was begun.
even men engaged in this educational work. Their
o the production of poultry, hogs, beef cattle, to the
ares for feeding these animals, and to the various dairy

briefly, the character of work that is in progress.
AN. Let me ask you to amplify Dr. Taylor's statement
work differs from the ordinary demonstration work
arious parts of the country. Dr. Taylor made a state-
work consists, first, of investigational work and, sec-
strational work.
do not know just what Dr. Taylor had in mind, but
fference that I think of is that this work is more spe-
similar demonstration work that is in progress.
, every farmer in the community has a few chickens
ave been very poorly cared for and which do not sup-
ufficiently. The poultry specialist has undertaken to
ty agents how they can teach the farmers in their
ties to produce eggs and chickens in abundance. The
s been done with reference to beef cattle, hogs, and
do not know what Dr. Taylor may have had in mind
hat, but that is more direct and more specific than any
e have had in progress.
I want to say just a word that may help to clear up
ittle. The reason for this work, both investigational
tional, is the single-crop agriculture which this region
lred years or more been doing, which left the farming
t to whatever happened to cane sugar in competition
r, or frost or flood, or anything else that might happen

which appeared to require attention from the depart-
ssist these people in getting to a basis of agriculture
self-maintaining. There was lacking both the equip-
experience, and, what was still more important, there
the minds of the people anything that approximated
t it could be done.
grown up in sugar—their whole activity had been
eir whole farming was on a highly unsafe and largely
sis. So that this specialized extension work was out-
effort has been made to develop it with particular
neeting conditions that were there, which are hardly
where with the definiteness that they are here.
MAN. Mr. Rawl, you said that this was a regional

Yes.



. The average 640 acres, however, would not require
t we are planning to do here.
. What is the object of having those sheds in that
t on account of the blizzards?
They are for protection. There is a condition there
s you can not appreciate. The cattle appear to suffer
om the damp winter winds. At a temperature about
e will show signs of suffering such as you would ex-
Kansas, say, at a considerably lower temperature. It
damp, windy weather of the Gulf coast is hard on the
for the kind of work we are doing they must be pro-

IAN. As a matter of fact, the humid conditions here
n at a very much higher temperature will make the
p just as much, comparatively speaking, as in Kansas
estern States.
It is usually considered so.
. You spoke of the State giving the land. Do they
it?
So long as it is used for this purpose.
IAN. Mr. Steele asked you if this was to be an in-
t down there.
That, of course, is a thing that will have to be deter-
future. It will take a number of years to deal with
thoroughly and comprehensively. What the ultimate
operty would be 10 years hence is, I think, a matter
can not be decided now, but I think it will take at
o 10 years to complete the work that is proposed, un-
n a very much larger scale than it is being done at the

only six different feeding experiments with beef cattle
, and for this 100 head of cattle are required, which,
ound, cost a good deal of money. We have eight small
will make it possible for eight feeding tests to be con-
ime. If an attempt were made to do the work in a
t would cost more, and I do not believe it would be so
planned at present. We ought to have more pasture
ink possibly we can get it. There is a lot of pasture
ne, but aside from this I think the plant is as large as

. In some of these experiments you are feeding dif-
f grain feeds—corn, for instance?
We do not plan at present to go into the technical
he feeding values of ordinary feeds. For example, all
le are being fed on cottonseed meal. The comparative
nd corn is very well established. Furthermore, it is a
ot a regional question. We are using cottonseed meal
a local concentrate and hence readily available. If
s to interpret the results in terms of the other staple
lo so to a reasonable degree by calculation. Our plans
time are to be make the tests thoroughly applicable to

. Just to consume the feeds of those localities?

affect the supp

its effect

of this situation

e that their country,

ght in the

ding with it as

ing of the questi

the view of fully

yet, then, in

I think there is suf

a considera

as that affect th

know if there

in the past years

Mr. ANDERSON. Yes. I think, then, Dr. I

several years at

I think it would be ver

Mr. ANDERSON. My impression may be

that with this item was ju

temporary processes and tro

item that it was much

that I had anticipated it would be

ANDERSON. I think that is tru

economy we all thought this problem w

the results of the six beef-cattle experiments, using
lage. The lot fed on cane-top silage compares favor-
fed on corn.
The cane tops would have been absolutely waste mate-
l in that way?
Until recent years the cane tops have been burned, be-
e so bulky. The growth of the cane in a good year
t 5 to 7 feet high. Something like 18 inches to 2 feet
green and has to be cut off, because it interferes with
sugar that is made. That green top which contains
of sugar, along with the fodder is thrown down in
t makes a very large bulk. The cane growers will tell
entage it constitutes of the whole plant.
How many tons to the acre does it amount to, in your

I should say from 2 to 6 tons to the acre; 2 to 5 tons,
l be more conservative. The cane planter runs a three-
consisting usually of cane the first and second years,
the third year, the peas being plowed under. The
plowed under to a considerable extent in recent years,
hey were frequently burned.
r. Do I understand you to mean that the cane tops
silage as the cornstalks, or as good feed as the corn

The cane-top silage is being compared with corn silage
nstalk, including the ears), and thus far the cane tops
very well with the corn. The pounds of gain per
l during several periods for cane-top silage are 3.1,
; and for corn silage 2.9, 3, 3.7, 2.4, 2.8.
Is that the gain in pounds per day?
Yes; feeding the same quantity of cottonseed meal
amount of silage to each lot.
e made a preliminary feeding test with bagasse. This
ne year, and the grinding season, therefore, was short,
out 30 days; so we had bagasse for this time only. A
mals were fed on it to see whether they would eat it
hey would thrive on it; and they did splendidly. We
some means whereby this bagasse can be made avail-
r a longer period, either by putting it into silos or by
comes from the crusher. At present the cattle that are
orghum silage are making better gains than those fed

IAN. You are distinguishing between sugar cane and

Oh, yes. The real sugar cane, from which sugar is
ely different from sorghum. We are raising the sor-
cause it is very well adapted to that country; it makes
than corn and costs less to grow than sugar cane.
The cattle feeders in my part of the country buy a
orghum to feed with their corn.
Yes.
. As I understand it, the purpose of your demonstra-
out whether diversified farming is profitable in that
country?

at pastures in that region properly developed will for a longer period than pastures in almost any other ited States. There will, however, be a period in win- attle-breeding cows and young stock will have to be these by-products which have proved successful can tering such stock.

see the real problem is much more extensive than ining the feeding value of certain products they have

. Unless you can demonstrate that it is a better way ng dropped in the fall, it will be a failure there, will

Not necessarily. Our observations have not gone so ant us in saying that, but there is a difficulty there- et. Of course, animals can be weaned there in the fall. ll die. The majority even do not die, but all of them Ve feel now that the logical thing to do is to have some ed in the spring and others in the fall so that we can etter. Winter crops, like oats, rye, etc., will furnish ed young adequate grazing most of the time during y fall these animals would be 1 year old and much and thrifty and able to stand the conditions.

AN. The next item is automobiles, for which I have bcommittee, and we will not take the time of the full nvestigate that.

ittle statement here, on page 221, gentlemen, that I your attention [reading]:

ployees of the Department of Agriculture traveling on official uthorized by the Secretary of Agriculture to receive per diem u of subsistence, in accordance with section 13 of the act of Public, No. 161, 63d Cong.), shall receive such allowances from ppropriation provided for herein and made available for travel s of $1, $1.50, $2, $2.50, $3, $3.50, or $4, varying with the char- be performed and the section of the country to be visited.

rse, is put into these estimates under the act referred t be carried in our appropriation bill. I thought we inquire of Mr. Harrison, who is here, something about e there any questions? Is this item filed with respect ents of the Government service?

ON. I do not now the practice of other departments. the sundry civil act of August 1, 1914 (38 Stat., 609), heads of executive departments to prescribe per diem ance not exceeding $4 in lieu of subsistence to persons ld work or traveling on official business outside of the lumbia and away from their designated posts of duty rwise fixed by law. It also requires that the estimates ions from which per diem allowances are to be paid lly state the rates of such allowances. The provision s inserted in the estimates to comply with this provi- t to be made a part of the bill. It is in the nature of a gress.

. We make appropriations for traveling under each

ON. Yes, sir.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Monday, February 14, 1916.

AFTER RECESS.

tee reconvened at 3 o'clock p. m., after the expiration

OF DR. A. D. MELVIN, CHIEF OF THE BUREAU OF ANIMAL INDUSTRY.

IAN. On page 220 of the Book of Estimates, item 6, is tion for the eradication of foot-and-mouth disease and us diseases of animals, $2,500,000, with this additional

the payment for animals hereafter purchased may be made on ed on the beef, dairy, or breeding value: *Provided further*, That in case n breeding value no payment for any animal shall exceed three times value.

ion relating to the quarantine at Hawthorne Park, Ill., of the dairy herd, is omitted.
is present and will discuss this item.
. That, as you know, Mr. Chairman, is an appropriation reserve to meet any emergency, in case there should be outbreak of foot-and-mouth disease or other unusual imal disease during the coming year. We do not expect not—to have to use it, but we think, in view of the the past, that there should be a large sum reserved for haracter should the occasion arise.
IAN. Doctor, I think it might be well to give a short ir efforts to stamp out the outbreak of foot-and-mouth occurred in October, 1914—I believe it was.
. Yes, sir.
IAN. How much money you have expended and some- efforts in going about it. There will probably be a lot sked on the subject.
. The disease appeared in Michigan a year ago last diagnosed as foot-and-mouth disease in October, 1914. was undoubtedly carried from that point into the Chicago, and from there there was a broad dissemina-

number of animals slaughtered in eradicating foot-and-mouth disease, the Federal Government in indemnifying owners, cost of disposal, and expense incident thereto, for the period from November, 1914, to Janu-

Number of herds.	Animals slaughtered.					50 per cent appraised value of animals destroyed.	50 per cent appraised value of property destroyed.	50 per cent cost of burial, disinfection, etc.
	Cattle.	Swine.	Sheep.	Goats.	Total.			
33	733	143	.....	.....	876	$24,183.05	$659.64	$3,123.70
12	152	49	22	.....	223	4,033.88	248.00	1,997.96
3	48	5	.....	.....	53	3,269.66	187.00	13.30
1,214	31,004	46,044	2,017	[1] 56	79,130	1,257,761.19	19,349.45	190,020.55
121	2,363	3,912	615	.....	6,890	88,961.62	845.62	1,433.50
48	1,547	2,334	32	.....	3,913	62,648.45	664.74	4,830.48
6	1,217	313	.....	.....	1,530	39,460.99	51.93	3,072.75
84	2,951	918	216	1	4,086	66,632.28	583.28	7,918.74
56	964	1,621	197	.....	2,782	33,216.17	3,343.30	7,364.14
99	2,119	5,705	77	11	7,912	117,011.57	4,527.97	17,981.19
273	2,947	4,042	852	.....	7,841	105,396.69	753.05	7,507.49
1	25	35	.....	.....	60	1,191.90	34.63	80.09
33	1,408	11	237	.....	1,656	33,801.35	77.50	1,013.43
3	78	26	.....	.....	104	2,479.75	139.75	386.63
50	1,314	815	9	8	2,146	62,248.04	817.65	4,093.31
187	5,454	623	150	38	6,265	231,372.94	3,820.95	15,831.85
222	4,019	4,994	3,136	1	12,150	178,225.95	1,420.06	13,624.37
904	14,989	12,055	369	17	27,430	467,564.93	34,973.17	53,286.29
59	988	375	33	.....	1,396	36,000.25	1,177.13	4,783.08
8	378	470	.....	.....	848	13,871.77	250.22	979.91
1	102	.....	.....	.....	102	2,025.00	.....	.....
22	193	189	114	.....	496	6,407.08	654.22	1,232.06
40	1,504	1,764	1,435	1	4,704	59,577.55	918.72	7,795.89
3,479	76,497	86,443	9,511	[1] 133	172,593	2,897,442.06	75,497.98	348,370.62

[1] 9 deer.

.....	$2,897,442.06
.....	75,497.98
infection, etc.....	348,370.62
penses.....	1,122,930.43
.....	4,444,241.09

ON. Will you give us now the total figure showing the for animals, for salaries, and so on—not by States, but e?

. That is shown in this statement. Do you care to have

ON. I would like to know what it will show.

. This tabulation will give that information by States. le destroyed there were 76,497; swine, 86,443; sheep, 133; making a total of 172,593. Fifty per cent of the ue of these animals amounted to $2,897,442.06; 50 per alue of the property destroyed on account of disinfec- 497.98; 50 per cent of the cost of burial, cleaning, and and miscellaneous expense was $348,370.62; making per cent of the amount of claims of $3,321,310.66.

. Doctor, in connection with that, can you give each rtion of payment as to all stock that was destroyed?

N. Yes. All of this work was done with the under- the State would assume 50 per cent of the expense, salaries of the men. We did the best we could with services of inspectors and others. We furnished what the State furnished what they could. In some cases

t where the States feel they are responsible financially
in these matters we will receive a great deal more of
om them than we otherwise would.
. The suggestion I made about the National Govern-
ng the money—what do you think of that thought?
. I do not believe the National Government would be
n very much after it had once paid the bill.
. I do not know about that. The point that I can see
d 100 head of cattle and I owed a bank $10,000, and I
certain signs upon which I had informed myself, that
the foot-and-mouth disease, as a matter of self-preserva-
edit and from the fact that the State legislature would
r two years, I perhaps would run those cattle to market,
ay spread the disease. I believe that is true of every
ver known—that he takes care of his own credit; but if
going to get immediate payment to meet my demands
hen I would say to a veterinarian: "Come to me at once;
ss." Then, if it was shown that my cattle had foot-and-
e, I would know I was going to get my money; my
know that he was secure, and in that way the owners of
ssist the Government in eradicating the disease instead
it.
N. As a matter of fact, in the hundreds of outbreaks
had (and this statement shows just how many there
e not found a disposition on the part of farmers to dis-
animals surreptitiously. The disease was usually either
he farmer or the herd was known to have been exposed
ed in quarantine and held under observation. There
very few instances during the course of this whole out-
we have evidence of violation of quarantine. We have,
remarkably good cooperation on the part of the farmers
n in this work.
MAN. This basis of division between the States and the
ernment, Doctor, has been carried out in all the out-
t-and-mouth disease in this country, or is this only a
d of handling it?
N. The proportion has changed somewhat in this last
n the outbreak of 1902 and 1903, the proportion was
for the Federal Government and 30 per cent for the
t was a very limited outbreak compared with this. In
one, in 1908, the proportion was one-third and two-
felt at this time that as a half-and-half basis had been
many other projects that the Government had entered
ates that it should be put on the same basis, half-and-

MAN. Doctor, I wish you would tell us something about
of appraisement. What was the basis of appraisement
utbreak you have had—beef value, dairy value, or what?
it, but I want you to tell us.
N. In this recent outbreak, as well as in previous out-
aluation has been, in the case of dairy herds, upon their
n, and in the case of beef herds upon their value as beef
t was adhered to until the last action of the Illinois Legis-
ich they fixed a maximum for value of full-bred cattle,

AN. In all cases your settlement with the owner, I made upon a basis of agreement as between the owner aisers?

. Yes, sir.

AN. And the appraisement was usually acceptable to

. Yes. Of course, often they felt they did not get n as they ought to, but under the circumstances, with their herds and in order to help protect their neigh- re willing to accept it. We have one adjustment now eration of some dairy cattle that were shipped from consin which were finally overtaken and slaughtered in Washington, where one inspector, misunderstanding which the department was appraising cattle, arranged e, and they were appraised on a beef basis, which, of ery much less than their value as dairy cattle. That nder consideration.

TLE. Doctor, I would like to ask you if it is your policy n the owner as cheaply as possible, or do you try to real value?

. I would not say as cheaply as possible. We try to ing on an equitable basis. We do not aim to give the an he is entitled to, and we do try to give him what he on the beef or dairy basis.

AN. Doctor, just how does this new language, which f appraisement for the future, fix a basis different from appraisement upon which you have been acting here- inguish between the two.

. It would allow us to pay more in the case of regis- han we have been paying and still confine it or keep it nable bounds. We do not feel that the department tified in paying some of these very high fancy prices casionally obtained for blooded animals, and yet we bled to pay more for animals that had a real enhanced unt of their being pure bred and registered.

AN. The future basis will be three to one. Is that the

N. Not to exceed 3 to 1. Of course, in the majority uld not be three; it would be less than three.

SEN. What do you mean by "3 to 1"?

N. This provision would allow the department to pay d animals not to exceed three times their appraised inary beef or dairy cattle, or good beef or dairy cattle, tered.

AN. Is that general idea of appraisement clear to the the committee?

EY. Is this three-to-one basis an arbitrary basis, or is it n some experience in sales? How did you arrive at the to one rather than four to one or two to one?

N. It is more or less arbitrary; there is no doubt about be two or two and a half or four or five. But we rather the department goes to the extent in exceptional cases ree times for registered cattle what it might for those

There were several hundred people there.
. And the plan met with general approval; is that ling?
On the part of those who expressed themselves. Of as no vote or poll taken.
. And you know of no particular opposition to the ?
No.
. No opposition with reference to fixing the price of l animals at three times the beef or dairy value?
My impression is that this new proposition met with val. There seems to be in many States a tendency imum amounts that might be paid. I presume that to the fact that the legislatures want to keep control ole amounts that may be expended.
d of Guernsey, for the purpose of eradicating tuber- xed an amount for milk cows at 21 pounds sterling; years, 15 pounds; 1 to 2 years, 12 pounds; heifers 6 months, 9 pounds; bulls 2½ years and over, 21 pounds; years, 18 pounds; bulls 1 to 1½ years, 12 pounds; ox r, 15 pounds; ox 1 to 2½ years, 10 pounds, 10 shillings; months to 12 months, 77 shillings.
re this to show the tendency to fix maximum prices. he States now have maximum prices, some of which , having been fixed some years ago when prices were vania at that time had a maximum, I think, of $40 n the case of pure-bred cattle. A number of the States imum prices. The laws of some of the States prohibit of any amount, but usually they provide some reim- re or less.
LE. What is the maximum of Kansas, Doctor?
. I do not think they have it fixed by law in Kansas. t in the hands of the live-stock commission of the State.
. How do the prices referred to compare with the of these animals?
. The average price of Guernsey cattle is much higher s given.
. You are speaking of some foreign cattle?
. The island of Guernsey.
. How do these prices compare with the average sell- e?
. They are less, I think.
. Than the average prices?
. Yes, sir.
. You were referring to the show cattle a minute ago. er been disposed of and settled satisfactorily?
. I do not know how satisfactory it is. We are under- e a settlement now. That was discussed before you

. You started on that and then got off on appraise- appraisement was not made clear. Did you find it ppraise the cattle in order to determine what would be the expenses?
. Yes, sir.

If I would ship them on to the market and would ter them as beef, they would not be worth 6 cents a

EN. It seems to me you would get a fairer proposi- ed your settlement on the value of the cattle as regis- and then say that the maximum of your settlement ertain percentage of their value as registered stock, ing it on the beef value. That would not necessarily are to pay any more per animal, but it would give a nt, because you put it on the basis of what those are tered stock and what they are rated for. They are ered stock and sold as registered stock, and they have tered stock value. If you base your settlement on a tage of that, not to exceed that, it seems to me you better standard to go by than to call all those cattle or "dairy cattle."

I may be a little thick-headed, but I do not quite nt. It seems to me this legislation we are asking for point that you have in mind.

EN. To illustrate: I am raising a herd of cattle, not or the market as beef at all. I am raising them as le, hoping to sell them to stock raisers as registered he markets of the country they have a certain value attle for breeding purposes. That is so well estab- s to me, that it would be just as easy to find the fair erd as registered cattle as it would to find their beef vould equalize the dealings between the smaller and s. That is one thing. Another thing is that because feed, perhaps, I have got a herd of thin cattle that as much as they would be if they were in better flesh. r system, if they happened to be small cattle and hap- poor flesh because of shortage of feed, you are going praisement on the beef value of those cattle that you g with, which might be only feeders. If they were all or the market you could perhaps get a fairly good esti- value, but if they were thin it would be manifestly seems to me that if you could establish a fair price gistered stock, and then make your maximum limit ntage of the market value of registered stock of that ld get a much fairer basis for settlement than you eef basis.

I do not think there is any system that can be devised rk out on a large scale to the complete satisfaction of here would be, in many cases, a great amount of the strain of the blood of the animal itself—its blood n the same breed of animals. Take the Durham ance. One breeder has his fancy for a certain strain, a different strain, and I do not think we could ever value without having some sort of a definite basis. to me that this would be about the fairest that could

EN. Is there any place else in the world where they beef value of settlement? I noticed you read figures l of Guernsey. They make the maximum price?

holding out he can get more and more the inclination
o that rather than to make ready and reasonable set-

Doctor, I do not think you understood my question
ou did, I have not the correct thought. Now, we will
ıbors whose stock have the disease. You want to kill
'ore the cattle are loaded for the market. For the one
ttle you fix the value as to their beef value, as I under-

ıan has a bunch of stock cattle, as Mr. Helgesen said,
You would not base the value of that bunch of stock
value as beef cattle—as to what they were worth for

I think that has not generally been the way it has

I would think that valuing them for beef would be
is fact. To illustrate: I have 100 stock cattle. They
thin. I may have bought them thin or I may have
ı, but I have borrowed the money from some bank, and,
I had paid 6 cents a pound for them.

EN. Mr. Steele, that 6 cents may be vastly more than
l for as beef that day.

Yes; they would not sell for 3 cents a pound for beef
hen, I would have to sacrifice, or the bank would have
ıause I am not able to pay for these cattle. The banker
ɪredit upon my agreement to take care of these cattle.
, if that was the rule of the department, that the banks
loath to loan money upon stock cattle if they thought
ıouth disease was going to spread. I think that the
ɪoposition would be upon their value as stock cattle.

We had a few cases of that kind, sir, and in most of
t say all of them, but in most of them) we took the bill
ıasis for settlement.

Or bill of purchase?

Yes.

I think the department should fix the price on the
alue as stock cattle in order to get to slaughter them.

EN. Here is another thing that enters in there: Suppose
ought 100 stockers at 6 cents. They take your bill of
on the basis of 6 cents a pound. Say, I had another
e, which I offered to-day as beef cattle. I would get
ıis is a case where I have not got a bill of sale, and I
ɜ much as you do for the same kind of cattle.

I believe that the department would say, "Here,
npared with Steele's cattle is about the same." They
ɔu the same for your cattle—not that they based it on
t believe that would be a good policy, because banks
ıse to loan the money.

AN. Doctor, you said awhile ago that in arriving at
ıe basis it was an arbitrary figure that you had resolved
ed to ask the question whether or not it is really an
, or do stockmen find that the real difference in value
airy cow, for instance, and a dairy cow for breeding
the ratio of about three to one?

Dr. MELVIN. No, sir; that three-to-one basis was provided a maximum basis. As a matter of fact, the department did not exp it would be required in the majority of cases to pay probably m than two to one, and in many cases not even two to one, becau do not think that the pure-bred value is greatly in excess—tha it would not average more than one and a half times the valu registered cattle of the same type. There will be exceptions, course, where the cattle will be outstanding and will really be w more. We felt that three to one would cover the bulk of t cases. Occasionally, perhaps, it might not be sufficient, bu would be a pretty fair limitation.

The CHAIRMAN. I had two thoughts in mind. One was that department had probably worked out what the real ratio was betw dairy cattle and dairy cattle of the registered kind, in the first pl In the second place, I felt that, if this ratio was higher than actual ratio, it would tend to a policy of the overvaluation of t registered cattle. What do you say as to that last proposition?

Dr. MELVIN. That would depend. It would be up to the dep ment to keep it down within reasonable bounds.

The CHAIRMAN. That is a natural answer.

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Have you considered the proposition of fixi maximum limit rather than a ratio limit here?

Dr. MELVIN. We did discuss that to some extent, but we fi concluded it would be less satisfactory than having a limit somew more flexible.

The CHAIRMAN. Doctor, what do you mean (I may be getting into a discussion of terms that technical men disagree upon) by term "breeding value?"

Dr. MELVIN. Animals by their breeding, by their ancestry, an their progeny do have more or less of a fixed value, because reasonable to think that animals that are well bred and have b bred in a certain definite way for many generations will repro rather closely to type. That would be breeding value. An ordi individual, which might be outstanding, but of no special bree for any great length of time, might not, and the chances are it w not, be a consistent breeder.

The CHAIRMAN. So that breeding value would be, then, the po to reproduce a type?

Dr. MELVIN. Reproduce a type; yes, sir.

The CHAIRMAN. Are there any more questions on the appr ment side of this question?

Mr. DOOLITTLE. Doctor, what other suggestions have you to m as to the language of this item with reference to the manner of appr ment and maximum valuation that were suggested to you at Chicago meeting you had?

Dr. MELVIN. There was no definite suggestion as to any o method of appraisement—that is, which would fix more definitely appraisement. A good many of those who expressed themse indorsed the language of the New York law relative to the uti value as producing and breeding.

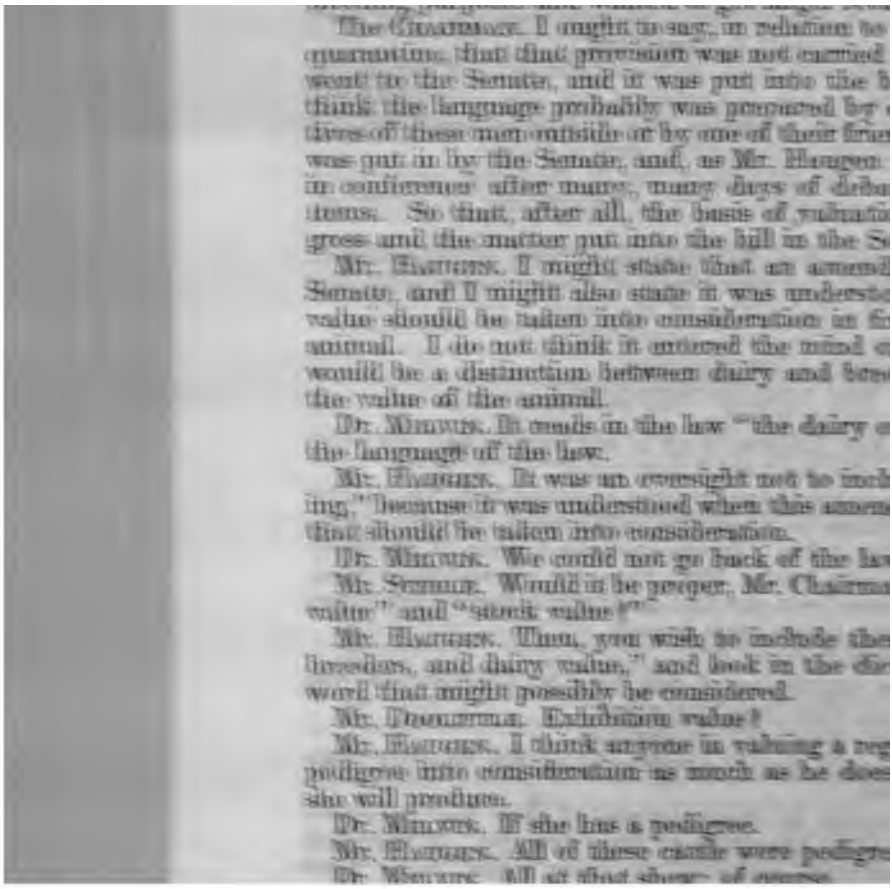
Mr. DOOLITTLE. Explain that for the record—what you mean "utility value."

. I presume what they meant were animals well bred
eproduce, or that those likely to reproduce their own
ve a value as breeders, or, in the case of milk cows, a
I am not indorsing that language. I think it is more
nyself.
TLE. You are not indorsing what language?
. This language of the New York law.
. Doctor, I take it that essentially the plan suggested
en would be fairer to the owner of a valuable animal
suggested by you. For instance, I know of a young
unty purchasing a bull calf for $1,000 at a sale. That
ably not worth more than $50 for beef. Under your
he maximum he could get would be $150 for the calf,
r. Helgesen's plan, if you decided to pay the owner 50
e actual value of the registered animal, he would get
it the plan suggested by Mr. Helgesen would be fairer
f valuable animals, but, as I understand it, your plan
ost of the cases, and the majority of them would receive
tion in nearly every instance, as the breeding value
eed three times that of the beef value.
. I believe that at the hearing of the subcommittee of
gricultural Committee the question was asked of a
eder as to what he thought the average value of pure-
re over grade cattle, and his answer was one and half
he value of unregistered cattle.
. According to your plan it would be fairer to the
eeders than the one suggested by Mr. Helgesen; is that
ere would be fewer that would suffer under the other

. It would be more workable. I would not say it
e fair. I think that any plan adopted by Congress
as definite a form as possible, so that we can attain
wish—to purchase, slaughter, and bury these cattle as
sible.
. At the average price of one and a half, they would
mpensation, would they not, because you provide pay-
nes the beef value, and under the percentage plan they
50 per cent or 75 per cent—whatever might be agreed
s only in cases where the value of the animal exceeds
e value of the beef?
. What percentage of chance is there for an animal
d-mouth disease to recover—out of a hundred, say?
. Probably 95 or 97 per cent would recover; but that
alified by the statement that they would deteriorate
quality, and that it would also be possible in the case
that their bags would be injured to such an extent as
rge percentage of them practically of no value.
. Suppose, then, there was a pure-bred bull that got
How much would he be worth after he recovered from
d with what he was worth before?
. That would depend on the care that the animal
he was sick. In the case of this dairy herd, where
very best care procurable, the losses were very light

se of dairy cattle. While I was in Argentina my at-
lled to a dairy herd of 150 cattle that had the disease,
st a short time before, and only three of those cows
ng milk; all the rest had temporarily dried up, so that
he man out of business for a great length of time.
. That was the point I wanted to develop. The dairy-
est particularly, who had their stock in that show—the
a Wisconsin—were very much put out with the depart-
reliminary steps regarding whether or not the experi-
e tried. The general impression is that the Bureau of
try was opposed to any attempt to cure, and it was only
istence and pressure from all directions that they were
ry the experiment to cure them.
. The very fact that we recommended the placing of
partitions within the building and the construction of
ns is in itself evidence that the department did not
he slaughter of this entire herd of cattle.
. Then, your understanding is that the quarantine
as at the suggestion of your department, at its recom-

. Originally, yes, sir; because we were afraid infection
to that herd and were afraid of disseminating it all over
hrough the disbanding of the show.
. The herd was cured completely?
. There were a few that died.
. Those that went out were cured?
. So far as we know.
. Have you followed it up in any way to find out what
effect on the herd since that time?
. We have made two or three inquiries from the various
of the States to which the cattle went, and the replies
iem are favorable. In one instance I know of the reply
able as to one herd. They have not advised since then.
. Has there been any foot-and-mouth disease developed
of sending those herds home?
. Not that I know of.
. In the appraising of this herd at Chicago did you
count at all their breeding value?
. No, sir; their milk production.
. You would simply appraise it on the basis of their
tion value?
. According to their records—if they had records—
mselves, their ancestors, or their progeny. If they had
ords, they were appraised on dairy value, based upon
al appearance.
. Under this proposed provision of the law, could you
sed them higher?
. Yes; under the proposed provision of the law they
been appraised higher.
. There was a great deal of dissatisfaction with the rep-
of the Department of Agriculture with regard to that
he men who had cattle there. They thought they were
ly treated, and considerable criticism resulted from the



N. Still you find the average value $169?
. $169.
N. I thought the contention was, in this instance, that nimals were worth several thousand dollars.
E. I believe the department looked correctly at that e doctor has stated. They were assembled there from s of the United States. The people had been a long time e herds, and I think they used good judgment in trying is seed, but, as I understand it, the department s usual that when cattle get the foot-and-mouth disease in a rd it condemns them and kills them.
. Yes, sir.
TTLE. Doctor, there would be no protection for the man nimals for exhibition purposes over the value which he under the law, the way it is now, either for the beef or ue; is that right?
N. Not under our past practice.
TTLE. I want to ask you if you ever heard of the steer arlie, which weighed about 4,000 pounds and was owned ver, of Eureka, Kans.?
N. I have heard of several mammoth steers; perhaps that n; I do not know.
TTLE. He was very valuable to his owner for exhibition

EN. I understood you, Doctor, to say one exception was his herd. How does the average value of this herd com- e value of the Scott Durand herd?
N. Mrs. Durand never accepted any appraisement, so far tment was concerned.
EN. They were appraised, were they not?
N. They were appraised originally, I think.
EN. I am not sure, but I have understood it was much 169; I do not know.
N. I am not sure.
EN. I understand you to say that it was not the inten- department to slaughter the whole herd. I believe the appeared before this committee a year ago, or at least in with some of the members, contended that it was the he department to destroy the whole herd and that they that and requested a quarantine. This was granted. It tisfactory to them than it would have been to have the ed. Their contention was that the herd could not be and that it was to the advantage of the country that the d.
IN. Neither the Secretary of Agriculture nor myself issued ions that this whole herd should be destroyed.
EN. Inasmuch as it was the policy of the Government to ds, we are to understand that they merely assumed that e purpose of the department?
IN. That may be.
ERSON. Doctor, attention has been called to certain items ure for traveling expenses from Washington to points Washington charged to this appropriation. For instance, an item of $476.30 to make a study of the preparation of

st and eradication of the foot-and-mouth disease, the payment of
it of past and future purchases and destruction of animals affected by
e foot-and-mouth disease, and for a deficiency in the objects specified
'General expenses, Bureau of Animal Industry,' in the Agricultural
t for the fiscal year nineteen hundred and fifteen, $2,500,000, to be
e Secretary of Agriculture."

this bill were twofold: (1) To defray the expense incident to the sup-
oot-and-mouth disease; (2) to reimburse the appropriation "General
u of Animal Industry," for the deficiency in the objects specified
asioned by the outbreak of that disease. In conformity with this
ie various subappropriations under "General expenses, Bureau of
y," which had been heavily drawn upon for defraying the expenses
iected with the eradication of the foot-and-mouth disease, were reim-
deficiency item of $2,500,000, as such action became necessary, by
of expense subsequently incurred for dairy, animal husbandry, or
ork to the emergency appropriation. In all such cases the vouchers
ore the title of the emergency appropriation, together with the title
opriation under "General expenses, Bureau of Animal Industry,"
pense was chargeable, thus clearly showing that the subappropriation
from the emergency appropriation to the extent of the amount covered
nd accounts of these reimbursements were taken up and carried on the
a this way. The items to which you referred on the floor of the House
is nature.

so, that in no instance was there a reimbursement of the original sub-
beyond the amount appropriated by Congress in the appropriation
l year ended June 30, 1915; indeed owing to the interruption in the
the Bureau of Animal Industry it was not necessary to reimburse the
opriations for all of the money which had been withdrawn for use in
uth disease work between the date of the outbreak of the disease and
15. The total amount withdrawn during that period from the regu-
ations was $807,170.63, while the total reimbursement from the emer-
ition amounted to but $529,135.63.

that this explanation clearly shows that the expenditures for travel in
h the several lines of work covered by the appropriation "General
au of Animal Industry," which were charged to and paid from the
opriation of January 25, 1915, were properly paid under the authority
ie latter appropriation. If you desire any further information on the
be pleased to furnish it.

ly, yours,

D. F. HOUSTON, *Secretary.*

RSON. I think that covers the statement I desire to get in
f the hearings.

RMAN. Is there anything further, Mr. Anderson?

son. I think not, Mr. Chairman.

RMAN. Is there anything further, gentlemen of the com-
his entire item?

EN. I wish to ask whether any such transfers of funds
nder the $2,500,000 recommended by this committee and
the general appropriation bill for the current year?

IN. No, sir; that has not been necessary.

EN. It all came from the emergency appropriation?

IN. Yes, sir.

EN. Under this language would you consider that you
ity to transfer from this fund or to use this money for
ses than herein specified?

IN. No; only for some emergency outbreak.

EN. You would not consider that you have the authority,
eneral law, to make a transfer of this fund to some other

IN. No; I do not think we have. That was specifically
r in the deficiency appropriation of January 25, 1915, but
present fund.

herd convinced me, and I didn't take up the matter with
" Did the department here repudiate the original ap-
f the Barton herd?
N. I think there was but one appraisement made of that

Y. His testimony, then, is evidently not quite clear on
here. So you did not take up the matter at all? He
act that they repudiated the appraisement of the other
ed me, and I didn't take up the matter with them at all.
tle are worth what they would bring, and if an animal is
l price it should be paid for that way; but, as I said before,
ng under instructions from Washington." Then his
were simply general and not to repudiate that investi-

N. His instructions at that time were that animals
praised upon their beef or dairy value, and I presume,
at, that he thought he had to adhere to those instructions
sider their breeding value.
Y. May I make a short statement, Mr. Chairman, on

MAN. Certainly.
Y. Gentlemen of the committee, this is the case of a
for 45 years had been engaged in breeding Shorthorns,
ally the herd was afflicted with the foot-and-mouth
e United States Government, through Dr. Bennett,
te Government, through its live-stock commission, were
perfect harmony and they ordered an appraisement.
praisement was made by the two gentlemen to whom I
. Kilgour for the State and Dr. Dye for the Government.
d at a valuation of $32,233, which was for the cattle,
h 35 hogs and 1 sheep. The average for the cattle was
head. Dr. Bennett then decided he had no right to
an appraisement, although Mr. Baker, the owner, had
e appraisement, had prepared for slaughter, and had
. Bennett they were ready for slaughter. Then Dr.
l him over the long-distance telephone that there would
another appraisement, and he selected three men, each
stified under oath that he was not familiar with that
le. They made an appraisement at a lesser value. The
t was $13,038 less than the Government appraisement.
was taken before the legislature of the State of Illinois
al committee was appointed, and as a result, the State
as paid its one-half of that difference, or $6,519. Mr.
this committee, in fairness to himself, that they make
o him of the amount at which the herd was first appraised
e accepted. He was then notified that if he did not ac-
r appraisement he could not get anything. He accepted
test, with the right of appeal to the department, to this
or to Congress.
ike to say in this connection that this outbreak began in
and I think perhaps we had more of it than in any other
e United States.
N. You had plenty, anyway.

benefit of society, would see to it that just compensation was made to
k was killed, in the effort to stamp out the disease, and further actuated
n that such drastic measures were necessary to the proper protection of
upled with the fear that a refusal on his part to sign might deprive him
east, of the value of his herd, consented to and did sign said agreement
d the stock was slaughtered and the Government and the State each
of the second appraisal, which was $19,195, or $9,597.50 each, leaving
our petitioner between the first and second appraisals of $13,038, or
Government and $6,519 from the State of Illinois.
er further represents that he presented this matter to the Legislature of
ois, asking the State to pay him 50 per cent of the $13,038, or $6,519;
ittee was appointed from the appropriations committees of the house
that said subcommittee met on Monday, March 29, 1915, at the Stock
hicago, and proceeded to take testimony concerning said claim; that
sat in the hearing of testimony on two different days at said Stock
t during said hearings the testimony of the following witnesses was
lgour, of Sterling, Ill., who made the first appraisal on behalf of the
arding, secretary and former president of the American Short Horned
iation; Thomas Stanton, of Wheaton, Ill., a breeder of pure-bred
e; John C. Baker, your petitioner; B. J. Shanley, chairman of the
Stock Commissioners of the State of Illinois; Dr. S. E. Bennett, Fed-
epresenting the United States Department of Agriculture; Dr. O. E.
eterinarian of the State of Illinois; Dr. L. F. Brown, member of the
Stock Commissioners of the State of Illinois; Rudolph M. Patterson,
Board of Live Stock Commissioners of the State of Illinois; Charles W.
harge of the hog department for Evans, Snyder & Buell, at the Union
hicago, and one of the men who made the second appraisal; C. H.
ck man at the Union Stock Yards, Chicago, and one of the men who
id appraisal; Charles Albert Dunbar, in the live-stock commission
Union Stock Yards, Chicago, and also one of the men who made the
l, all of which testimony has been written up and is now on file in the
ited States Department of Agriculture, Bureau of Animal Industry,
C., paged and indexed, where it can readily be inspected; that after
stimony the joint committees from the appropriations committees of
enate of Illinois reported unanimously that the first appraisal made
ier's stock was fair, just, and reasonable and recommended that the
pay the further sum of $6,519, which was 50 per cent of the difference
rst and second appraisements; that thereafter the Legislature of said
s passed house bill No. 885, a copy of which bill is now on file in the
ited States Department of Agriculture, Bureau of Animal Industry,
. C. That on page 28 of said bill, at No. 17, is an item which reads as

Baker, of Manhattan, Will County, Illinois, on account difference in
en first and second appraisements, $6,519."
l was duly approved by the governor, became a law, and that a short
your petitioner received said further sum of $6,519 from the State of
: now respectfully requests that the Federal Government pay to him a
iat paid by the State, or $6,519, in addition to what it has already paid.

THE TESTIMONY

says "I am not finding fault with any of the appraisements. I think
fine herd, he ought to be paid for it, while under our instructions, we
r breeding. We have never been allowed to pay for the breeding of
(See testimony, p. 34.) When Dr. Bennett was asked if he had con-
e authorities at Washington before repudiating the first appraisement,
he fact that they repudiated the appraisement of the other herd con-
d I didn't take up the matter with them at all. I believe cattle are
ey would bring and if an animal is worth a good price, it should be paid
ut, as I said before, I am working under instructions from Washington."
tion referred to here by Dr. Bennett was the appraisement of cattle
Barton herd of Dupage County, Ill., which were slaughtered, but the
aid for this herd an average price of $457.50 a head for the pure-bred

EXHIBIT A.

[F. I. Form 99B.]

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY.

to accept as compensation in full from the United States, in the event
appropriates funds out of which payment can be made, $16,116.50,
ent of the valuation of all animals destroyed on account of the exist-
is foot-and-mouth disease.

JOHN C. BAKER.

LL., *January 21, 1915.*

EXHIBIT B.

(John C. Baker, Manhattan, Ill.)

IS, *County of Will, ss:*

igned appraisers, having been legally appointed to act in cooperation
f the United States Bureau of Animal Industry in the appraisement
nd to be affected with or known to have been exposed to the con-
d-mouth disease, and subjected to slaughter upon request of the
ake the following appraisement, to wit:

.....	$3,150.00
.....	16,650.00
.....	10,500.00
.....	30,300.00
.....	1,575.00
's, 6 cents per pound, weight 4,171 pounds.....	250.25
5 per head.....	99.75
.....	8.00
unt of appraisement.....	32,233.00

y that said valuations are fair and just to the best of my knowledge

J. A. KILGOUR,
Appraiser.

d sworn to before me this 25th day of January, 1915.

JOHN G. WETZEL,
Notary Public.

EXHIBIT C.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY, LOCAL OFFICE,
Joliet, Ill., February 5, 1915.

KER, *Manhattan, Ill.*

nder instructions from Dr. S. E. Bennett, agreement and voucher of
by Messrs. Thompson, Dunbar, and Martin are submitted for your

these papers to me, after signing, in the envelope inclosed.

ectfully,

W. C. DYE, *Veterinary Inspector.*

made in spaces provided therefor on the back of this voucher become
ification.)

ed for..... $.....
....
for..... .....
(Signature) ——— ———
——— ———
[Title of approving officer.]

No. ...., dated ....., 191.., on the Treasurer of the United States,
named above.

ENT OF AGRICULTURE.

heck is in settlement of
scribed in the memo-
No acknowledgment is
which check is to be
———.
—.
——— ———.

MEMORANDUM.

The payee will please indicate bill number or such other reference as will enable him to identify this payment.
——— ———.
——— ———.

INSTRUCTIONS.

ould be used in stating accounts for supplies furnished, and for serv-
corporations, firms, and individuals not officially connected with
rtment of Agriculture, except accounts for transportation, express,
for which special forms are provided. It must not be rendered in

each bureau or division must be rendered on separate vouchers.
account in the name of the corporation, firm, or individual to whom
ly due.
lies have been furnished upon a contract, accepted proposal, or other
nt, the articles should be so described as to make comparison and
sy and certain.
ire of a corporation should be made in the following form: (1) The
itle of the company; (2) the autograph signature of an officer or other
the company competent to certify to the correctness of the account;
is office or the designation of his position in relation to the company.
Dennison Manufacturing Company, per Albert Metcalf, treasurer."
by a duly accredited representative of a firm or unincorporated com-
ade in a similar fashion. For example, "Geo. W. Myers & Co., per
hier."
s name must be in exactly the same form at the top of the voucher
ture to the certificate. A signature by mark must be attested by one
tness, whose address must be shown.
ating officers of the Treasury will not accept vouchers containing
ditions, alterations, or changes of any kind as evidence in supporting
ent, except such as may be made by the claimants over their signature

METHOD OF OR ABSENCE OF ADVERTISING.

709 of the Revised Statutes, and amendment thereto relative to the
Agriculture, Statutes at Large, 30, p. 957).
rtising in newspapers.
rtising by circular letters sent to ——— dealers and by notices posted
.
lvertising under an exigency of the service which existed prior to the
not admit of the delay incident to advertising.
lvertising and upon noncompetitive quotations, the aggregate amount
particular purchase of supplies or engagements of services not exceed-
50.

SEN. Was it Dr. Bennett who said that Mr. Baker had the cattle were worth?
. Yes, sir; that was Dr. Bennett; not Mr. Baker.
SEN. Of course, if Dr. Bennett had repudiated the first would be natural for him to claim that he had given were worth; else he would not have repudiated it.
MAN. Dr. Melvin, in how many cases, relatively, were isements made in this whole outbreak of the foot-and-e? Were there many reappraisements?
. Except in the case of this National Dairy Show herd ashington State, which we now have under considera-s been no reappraisement.
MAN. Is Mr. Baker s case under consideration now?
. No. Our Solicitor has rendered an opinion to the case is closed so far as the department is concerned.
. May I ask when he rendered that opinion?
. During the past summer, in a statement that was him to the Assistant Secretary referring to the Baker

. I talked to the Assistant Secretary only about six d he did not intimate to me that the case had been te to him a few days ago, and in his reply he intimated it up.
. I say "closed." I suppose almost anything of this reopened on new evidence.
. In view of the State making settlement, I should be no more than fair that the Government should pay e State people probably know the circumstances and hat stock better than the department does.
. The State is expecting the Government to reimburse expense under foot-and-mouth eradication. There is a bursing it for its entire expenditure.
. The State of Illinois?
. Yes.
MAN. Introduced in Congress?
. Yes, sir.
. Who introduced it?
N. Mr. Chiperfield; H. R. 9661. It involves $1,569,-

. I think it is safe to say they will not get it. You can e record as coming from me, too.
MAN. I think we agree with you, Mr. Copley.
Y. As a matter of fact, Mr. Chairman, that does not ity of Mr. Baker in this particular case.
MAN. Not at all.
N. As a matter of fact, the Solicitor of your department to close a case that is in dispute?
. I was using that term merely figuratively.
N. As a matter of fact, it is not closed as long as there n, is it?
. We can not prevent Mr. Baker from writing

DES MOINES, IOWA, *December 31.*

IOUSTON,
Agriculture, Washington, D. C.:
nile zone quarantine for foot-and-mouth disease are thousands of
arket 60 days; in some cases feed almost exhausted. Tenants unable
gations generally can not be met. Hogs threatened with cholera,
ing with it; great losses sustained by farmers. Can the Government
outside of 2 miles of infected farm after inspection may be shipped
for immediate slaughter, it would be great relief. State desires to
Government if it is possible and consistent with safety. May the
ranted.

GEO. W. CLARKE, *Governor.*

JANUARY 2, 1916.

ARKE,
es Moines, Iowa:
ctive January 1, permits shipment of stock for slaughter after inspec-
zone 30 days after disinfection of premises completed. This will
ase in near future much live stock now held in quarantine. Regret
reaks in Cedar and Iowa Counties will delay action in those localities.

———— ————, *Secretary.*

. That may be; but at the same time, unless the State
ork with us, or we with them—unless we are mutually
her—we can not cooperate, and if we have fixed lines of
e think are necessary to follow and the State does not
hen all we can do is to go back to the State line and let
t of the stock within the State proceed, and we will
quarantine upon the State lines.

That brings us back to your question, Mr. Chairman—
ad the department, Dr. Melvin, to stop an intrastate

N. By cooperation of the State authorities.

MAN. Let us see if we can not get that clear. As a mat-
ou have no authority whatever to interfere with the
pments?

N. No, sir.

MAN. The only authority, therefore, that you could have
only authority that could stop intrastate transactions,
State authority?

N. Yes, sir.

MAN. And whatever authority you got in this connection
e such authority as came to you from the State of Iowa?

N. Yes, sir.

MAN. Except that you did have the authority to quar-
tire State? Is that right?

N. Yes, sir.

EN. Your contention is that they prohibited the ship-
the State?

We have the telegrams. I will bring the telegrams to
e. They are in the records of Dr. Melvin's department.
about them. It is a well-known fact that the governor
of Iowa wired, for the executive council, asking for per-
ove this stock to Cedar Rapids.

EN. Within the State?

Yes.

EN. An intrastate shipment?

ny of these men were men who were unfamiliar with the

IYER. They had never seen it, probably?
N. They had never seen it, as they had never had an to see it.
IN. As to the extent of inspection, I understood you to going out of Chicago must first be inspected?
N. Out of the northern two-thirds of Illinois—stockers and feeders and dairy cattle.
IN. What is the expense of this inspection?
N. It will be the salaries of these 35 or 40 men, together bsistence and travel. They will be assigned to different ne States, and requests for shipments will be addressed n that district.
IN. Then the stock is inspected by a Federal inspector?
N. Yes, sir; now.
IN. And without expense to the owner?
N. Without expense to the owner. We ask the farmers men at the railroad station and take them out and back

IN. Have you been able to supply them with inspectors d delay in making shipments?
N. This order has just recently gone into effect. In fact, effect to-day, and the occasion for it was the finding of ses of disease down in Christian County, where the dis- existed before; and we were afraid there might be some es somewhere else and where the stock might be shipped other State and start up a new outbreak. We felt that few weeks we ought to enforce a modified quarantine of

MYER. There seems to be considerable complaint about on system throughout the country, and I was wondering ed in this case?
IN. That was largely because we had to employ inspectors who were not permanently connected with the depart- could not furnish our own men; so we gave commissions of men recommended by the State officers, and they were d at a nominal salary so as to entitle them to authority rstate certificates. These men in some cases did charge tant fees for work and caused a great deal of dissatis- nat account. Many, however, rendered good service and ners to market their live stock.
MYER. That is the feature to which I had reference. I now if that same thing exists at this time?
IN. No, sir.
MYER. What about the quarantine at the Chicago Union ds? Has that been released?
IN. That has been released to-day.
. I just want to ask you this, Dr. Melvin. You spoke erating with the State authorities. What is the highest the State that can make a quarantine?
IN. That differs in the various States.
. Would it not be the legislature?

rivers or railroads as boundaries, sometimes townships, es a 5-mile area or, in many instances, a 3-mile area. and expect to do it, but at first and until we can deter- these centers are it is necessary to stop the movement in a large area.

As a matter of fact, in the State of Iowa you held the p on the county until we got it reduced down to 15, then and then 5, and you resisted the legislature reducing it Is not that the truth?

N. I am frank to say that I believe that legislation would tal for the handling of another outbreak of the foot-and se. Fortunately, at that time, when there was so much d when the legislature had this bill under consideration ad been reduced to a minimum; but if the same legisla- same cry for limitation of this quarantine had occurred eak of the disease, I am afraid we would not have con- ection in Iowa to Iowa.

How many cases were there in Iowa when that telegram the governor?

N. I do not know that there were any. There were any.

. I think there were none, if I am correctly informed. ds, you wired the governor that if he signed the bill and ion had passed you would quarantine the State—not he foot-and-mouth disease but because of the legislation. rue?

N. We were not sure the disease had been entirely eradi- the State, and this bill was permanent legislation. The not merely to handle the situation as it was at that time d against any future outbreak. We did not know but xt outbreak would come in another section of the State.

. I just wanted to call the attention of the committee to he people back here have that authority and the Legis- e State of Iowa has no authority.

LE. If I remember correctly, you wanted to reduce the hat they had it to 3 miles?

. Yes.

LE. That was the bill?

. Yes.

LE. As I understood at that time, the Government was l with that short distance, so far as they had investigated, d not want to reduce it shorter than 5 miles?

. Yes.

LE. And the live-stock industry felt otherwise on the 3- nd protested through Mr. Gibson, who is the State veteri- ecting to the 3-mile limit and agreeing that it was neces- nd with the Government on that proposition. In other State veterinarian has worked jointly and harmoniously overnment officers and, through that harmonious coopera- ıy opinion and the opinion of most of the stock producers s brought about a reduction of that disease in a very short ıd something to do perhaps in requesting the governor to ill, as we thought we wanted to stand absolutely with the ıt officials in stamping out this disease. I feel that the

[redacted]

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Monday, February 14, 1916.

AFTER RECESS.

transaction of other business.)

ıMAN. We will turn now, gentlemen of the committee, to
e bottom of page 222, "To enable the Secretary of Agri-
)nduct investigations and experiments in problems con-
the establishment of dairying and meat production enter-
e semiarid and irrigated lands of the Western United
ding the purchase of live stock, the erection of barns and
ary buildings, and the employment of necessary persons
n the city of Washington and elsewhere, $87,500," and
Taylor to take up that item.

T OF DR. WILLIAM A. TAYLOR, CHIEF OF THE BUREAU OF PLANT INDUSTRY.

)R. Mr. Chairman, the relation of the Bureau of Plant
this item is merely this: As stated in the hearing for the
lant Industry on the fifth day, on pages 56 and 57, it has
ent as we have proceeded with our investigations of crop
n the dry-farming and irrigated districts that any sound
g agriculture in that territory must include a much larger
ement than has yet been developed.

; about to find information for the farmer with reference
: farming in connection with his grain and other crop pro-
ery great lack of information has developed. This is true
t because much of this territory, which was formerly a
)untry on a range basis, has ceased to be a range live-
ry, has been cut up into small holdings, and has started
ıing on a grain and similar crop basis. It now finds itself
ng these crops, with the result that low prices and un-
peration have come about.

ering the whole question (and its consideration was begun
ke two years ago), a department committee composed of
ves of the Bureaus of Animal Industry and Plant Indus-
'er the matter thoroughly, upon the Secretary's request,
d a plan of what appeared to be necessary. You may
was presented to the committee a year ago and was
the hearings at that time.

ideration of the matter during the past summer, which
ırsonal investigation of the conditions in the West by, I
ıe members of that committee, resulted in a still stronger
to the Secretary urging that work of this character be

ese people. To illustrate: A young fellow will go and
ers or ten cows. He can not get over a year and most
ne can get only six months to make payment for them.
ly afford to buy a $150 bull, but a community of three
alf a dozen could do that. They plant their seed, and
akers are on duty and they have to make restitution
lves, and consequently they have again lost their project.
ring, if a community could buy these calves and the
look after those people, whether in three of four years
ull out with their increase? I am sure it could be done.
t get it in a year safely. Do you get my thought?

DR. Yes, sir. Of course, that is quite beyond anything
mplated here, and the experience so far, I think, has
bout like this—and if this is not correct Mr. Farrell will
In those projects where it is fairly clear that the require-
e-stock work are understood, so that the venture is a
afe venture—so that the banker or even the merchant
them together can feel confident that the settlers are in
the information that is required to insure a reasonably
—the community itself finds ways of financing the farmers
t. But so long as no one knows and there is a lack of
o guide, no one having the money is willing or would
stified in making the advance. Therefore, what the
has contemplated is that there shall be developed that
rmation which is necessary to afford a basis for a sub-
elopment of a sound live-stock industry. Then spread
tion through the demonstration work that Mr. Farrell
is morning, and the other features will very largely be
f by the farmers themselves. It has worked out in that
certain of the projects where they have had a sufficient
erience to start them out.

E. I understand all these boys are debtors of yours?

DR. They are debtors of the United States, represented
rtment of the Interior.

E. It is up to you to assist these boys in the payment of
on, which they can not do under their present condition,
y can not raise alfalfa sufficient to pay the interest on
at $30 an acre.

DR. They can not cash in their crops.

E. No; if they had 10 or 15 cows they could do that,
ows would be better at 2 years, and the value of these
eir increase would make this note a better note than it is
one year. All these boys need is time on the growing of
and the producing of this milk and butter in order for
ceed.

RMAN. As I understand this proposition, it is to take up
oblem that Mr. Steele has in mind—to try to furnish
to these people out there with reference to methods by
can make what they are growing on their ground now a
something rather than a something that is practically
because of various conditions out there—distance from
station and things of that kind.

R. There are some; there are individual cases, but in
k not.
N. Have you investigated that?
R. Yes; in connection with the general inquiry as to
lition is?
N. In your investigations where do you find they came
ou in position to state from what States they came?
that many of them came from the Northern States and
hem had their knowledge of this class of farming?
. Not under the conditions under which they are oper-

N. The operation is the same? It requires simply feed
practically the same way.
R. Different combinations of cropping and feed are

N. This appropriation has reference particularly to
the feeding of dairy cows?
. Yes, sir.
N. To feed what is available?
. The utilization of the feeds that can be grown there.
dry-farming territory alfalfa is hardly to be considered,
a dry-farming district is adjacent to an irrigated dis-
it is a question of barley or oats or corn, kafir, milo,
her grain or forage that can be grown in that territory.
N. Is it the purpose of the department to teach dairying
g?
. The purpose here is to ascertain what is necessary to
ble dairying and live-stock production with the crops
n grow under those conditions.
N. Then, it has nothing to do with the growing of crops?
. No, sir; that work is already under way.
N. It is to teach them to utilize that particular crop
ble in that section of the country?
. Yes, sir. We feel that the crop-production feature is
ken care of, but we do find—and the demonstration
pressed that upon the department and upon the States
ve been at work—a lack of ability to say to the farmer,
in your dairy under these conditions," as they are able
lder sections.
N. Do you think it is necessary to send men out there to
le how to feed the alfalfa or whatever forage may be

R. Yes, sir. We feel it is necessary to learn how profit-
he crops that they can grow.
N. You have the people in charge of these stations—
ople, as all the people are who are employed by the
Is it not possible that the services of those people
red who could tell a man how to feed alfalfa hay to a
sending an extra man out there?
R. If there is alfalfa there.
N. Whatever is there?
R. No. Take the situation in the Panhandle of Texas.
t the present time, with a tremendous overproduction of

. We do not expect them all to be scientists out there,
me that scientific knowledge is not necessary in order
acre farm. I suppose they will do the best they can
umstances. Some people contend that clover hay is
an timothy and other people contend that timothy hay
than clover. But that is not the question. One feeds
feed. If one has timothy hay, he feeds it. No one
hauling timothy hay 20 miles to market and then going
ket and buying another load of some other hay. They
have. They produce certain forage, and they must
have. I take it one of your men possibly might go
tate, if they knew nothing about farming, and stay over
learn what to do. It is within the range of possibili-
f your men, knowing nothing about farming, might go
and after staying over night and possibly one day
le to tell the farmers all about it and what they ought

. If we could solve it as easily as that, we would be
so; but it is not possible for us to do that, of course.
n, in the interest of somewhat clearly presenting the
e committee, may I at this time present to you rather
ws of the interbureau committee which considered the

AN. Yes; that would be a good idea.
. The views as expressed by this committee were to

years it has become increasingly obvious that the permanence of
he prosperity of the settlers in many sections of the Great Plains
of the irrigation projects depend upon the establishment of live-
It is certain also that these industries must be established on an
basis from that on which they were conducted under the old range

conditions, if settlers are to introduce live stock into their agricul-
orrelate the animal industries with the production of crops on rela-
s. Farm feeding of live stock must displace largely the use of the
ry farming must be introduced in many sections which heretofore
live-stock industries to the production of beef through the extensive
It will be necessary for communities of farmers to work together in
lable free range, in correlating the use of the range with the disposal
ve-stock industries, and in marketing their products.
ings will necessitate profound readjustments in the regions under
ommerical grain production has proven unprofitable on much of
he West, but, on the other hand, these lands are well suited to the
age. Different breeds of live stock must be introduced in many
xample, where dairy cattle are to take the place of beef cattle, and
on the part of older settlers must be overcome. In brief, the agri-
nany respects be entirely reorganized, and one of the chief features
tion will be the development of methods for the disposal of crops
uction of live stock.
of developing and demonstrating methods of crop disposal through
live stock in the region under consideration, the department is not
her with the necessary information or the facilities for securing it.
with the dairy industry, for example, there is urgent need for definite
ding such problems as the most desirable pasture crops, pasturing
use to supplement alfalfa and pasture, and efficient and economical
taining and improving dairy herds on the irrigated lands and in the
. Some of these problems have already been attacked on the Plant
tions; but, with the equipment now available on these stations, the
ve been necessarily one-sided. For example, several pasture-grass
ng grown on some of the irrigated field stations, but it has not been

substantially the situation upon which the estimate
ie department sees it.
SON. I could see some value in a proposition of this kind
osed to go into these irrigation sections or into dry-land
start out upon a reasonable basis which the ordinary
possibly duplicate. But it is not difficult for anyone
dry-land section or irrigated section and raise cattle or
ry herd if the Government will furnish him with six or
id dollars with which to build the necessary barns and
a sufficient sum of money with which to feed the cattle
of them. Anybody can do that if the Government
money. The difficulty is to do this work under the
ich exist, and I can not see the value of an experiment
d upon a condition which the farmer can not possibly

. The point there, I think, is that, notwithstanding the
experience in Europe and in this country during the
hich our people have been handling live stock, we have
itable to the people to have the department and the
ient stations investigate just such problems as these
icultural conditions that prevail in the humid climate
-hundredth meridian. Not that the live-stock industry
aited to make a start until the experiment stations and
nt were established, but, certainly, the expenditures
been making during all the period since public activity
as first undertaken were worth while and have had an
luence in the development of our live-stock industry up
status. What we suggest here is such an extension and
s experience accumulated under these different condi-
be necessary to put these new types of farming on a
ilar basis; that is, on a fairly safe and economically

N. I do not see just how you are going to get that
ith the kind of experiments you are pursuing out there.
very great question as to just how valuable the experi-
at have been carried on at some of the experiment

. Doctor, how many acres of short-grass country are
keep an animal?
. If I may do so, I will ask Mr. Farrell to reply to that
Steele.
L. Twenty to forty acres is a common estimate.
. If that is true, how many animals would 160 acres

L. You mean on the land in its native state?
. Yes; on the dry.
L. Four to eight.
. Have you an average of the last 20 years as to how
have been raised in the dry arid country that would
materially?
. I will ask Mr. Chilcott to answer that question.
TT. I do not think we have had sufficient information
t very definitely, because we have a number of stations
arts of the Great Plains area and the results at those

SEN. Yes. Furthermore, they know they can raise feed; ey can raise a good quality of feed. It is not a question nething to feed, but of getting something to feed to.
MAN. Suppose we hear from Mr. Farrell.

T OF MR. F. D. FARRELL, AGRICULTURIST IN OF DEMONSTRATIONS ON RECLAMATION PROJ-REAU OF PLANT INDUSTRY.

LL. We might illustrate the need for this investigationa ing attention to two or three specific instances.
rth Platte project, in Nebraska, several years ago we ery simple way to find out the value of alfalfa as hog ose irrigated lands. We made this simple investigation crop-rotation experiment. We found that two or three h could be secured by pasturing the alfalfa with hogs and all ration of corn as a supplement as could be secured by alfalfa and selling it as hay. That was done in a very but as soon as we got some indicative results we placed iately before the farmers. The result has been that that w almost universally used by the better farmers on the I pointed out this morning, the swine industry on this ncreased in the last three years over 150 per cent. The from that project were nearly $500,000 in 1915; but now s have to be met. We do not know whether corn is as y as a supplement to alfalfa pasture. We do not know ed a 2, 3, 4, or 5 per cent ration of corn with the alfalfa e do not know whether some mixture of corn and barley ture of other grain that can be grown there would do as r than corn. Corn is not as yet a high-yielding crop e are a lot of questions that the farmers ask us in this hat we are yet unable to answer.
stance: In connection with the feeding of dairy cows question of grass pastures under irrigation. We nearly hat in a newly irrigated country the farmers are skeptical pastures under irrigation. They say they will not pay. tley project, in Montana, we began urging the establish- dairy industry about three years ago. A few farmers t, and they have been pasturing their cows on the road- vacant farm units, but others have hesitated to go into ause they thought, first, that pastures under irrigation ay and, second, that when these vacant units were gone be no pasture. So we started in a very simple way to e experiments there with reference to pasture mixtures. d cows to make a test of the pasture-carrying capacity, d that, as was pointed out to you a few days ago, this ture will carry more than two cows to the acre. This xpensive, because it contains a large number of grasses. know whether a simpler mixture would do just as well. now what the result would be with cows producing more er they would require more land or not. In other words, rely indicative information. These farmers do not want -eighth or one-tenth of their farms to pasture on merely formation.

ELL. No, sir; I said on the North Platte project we began
g it about three years ago.
GEN. I am speaking about employees of the Govern-
people the Government employs. What knowledge did
f it?
ELL. They knew nothing of what would happen on the
e project with reference to the value of alfalfa pasture
perimented there.
RSON. Do you want us to understand that there is a dif-
veen feeding hogs alfalfa out in Ardmore, S. Dak., and
a alfalfa somewhere else?
ELL. I believe it is necessary to have different adjust-
only with alfalfa and hogs, but with the whole farming
Ardmore, different from the one you have in Ohio or

RSON. I understand you take the position that you did
ything about it?
ELL. It is necessary to learn what are the best operations
erent places—different operations in these dry-land and
tions.
RSON. Then, I understand you to take the position that
know anything about the different operations in those
d irrigated sections?
ELL. I take the position that when those sections were
ody knew anything about what they would do.
RSON. What you do know about them you have learned

ELL. Yes, sir.
RSON. Don't you think it is rather undesirable to advise
out there to go into dairying and cattle raising until
v something about it?
ELL. Yes, sir.
RSON. I understand the department has been encouraging
into dairy farming out there?
ELL. Yes, sir; and at the same time we have been asking
authority and money to investigate these problems.
RSON. On this Louisianna proposition, it was estimated
ld take 6 to 10 years before they would be able to say
feasible to carry on dairying in that section. Do you
uld be as long as that before you would be able to de-
finitely whether dairying would be profitable in these
d irrigated sections?
ELL. No; I would not say that. I would say that every
ts would make us more serviceable to the community in
with any of these live-stock industries, and that we know
an we hope to know in a year from now.
RSON. Do you have any hope that you will be able to
y particular crops of grasses that can be grown in that
ch will reduce the cost of raising cattle?
ELL. Yes, sir; either new grasses or new combinations
hods of production.
LE. What kind of grass would you have in mind?
ELL. First, we would try all the common pasture grasses.
ould eliminate those that were less desirable and increase

IEL. Certainly. We do not need elaborate buildings, you ich to carry on our investigations.
RSON. It seems to me we ought to know what it is pro- pend for buildings.
IEL. If I may make my statement a little more complete, ate that we have already had experience in investigations ie ones planned for here. We have had a man stationed andle of Texas for a year or two, and there has been no e at all to the department except for that man's salary and ng expenses as he has had. We find there are plenty of ho are willing and glad to have a man who is competent— f you please—to go on their farms and conduct experi- stigations by using their animals, and they furnish the d equipment for it.
RSON. I presume there is some success attending it?
IEL. Oh, yes. I wish to say that nearly all of the beef- tigations that the Animal Husbandry Division is carrying re being conducted in exactly this way. We are doing st Virginia, North Carolina, at two points in Mississippi, is demonstration work I spoke of in the Panhandle of put a man on the ground and he does the experimental man who owns the farm furnishes the buildings, feed, everything else.
RSON. That is the way we do it in Minnesota.
IEL. We want to continue that just as far as we can. We tinue this work when we find it is desirable.
RMAN. Now, Doctor, what is your plan of working out this re? What have you in mind?
IEL. We have in mind establishing one more point of con- the case with the dairy work. I think Mr. Taylor made before. At Scottsbluff, Nebr., on the North Platte irriga- t, we propose to conduct investigations with hogs, sheep, ttle. At Dalhart, Tex., we propose to conduct investiga- beef cattle and with hogs, supplementing the dairy work. y-land station. At Ardmore, S. Dak., which is also a dry- n, we propose to do work with beef cattle and hogs, sup- the dairy work. At Belle Fourche, S. Dak., we will exper- hogs, beef cattle, and sheep. At Huntley, Mont., where re extremely small, we will experiment with hogs, lambs, d possibly also beef cattle. That, in a broad, general way, t that we had in mind in regard to the investigations in bandry.

NT OF MR. B. H. RAWL, CHIEF OF THE DAIRY DIVISION, BUREAU OF ANIMAL INDUSTRY.

IRMAN. Now, Mr. Rawl, what have you in mind in regard ry work?
VL. I can not offer such a small building scheme as Mr.

MMEL (interposing). Apparently I have given the com- newhat of a misapprehension. I want to say that in the nt of this animal-husbandry work on stations that are

already established, we will use as far as we can the building alr there, and we will also use in developing this plan, as far as may possible, the buildings that will be made necessary by the d projects where we work in conjunction with the dairies. Possibl is not just fair to the dairy projects for animal husbandry to l such a small building program.

The CHAIRMAN. All right, Mr. Rawl; what about your buil economy?

Mr. RAWL. Two years ago I was sent out to Ardmore, S. D. where the department has been conducting for a number of y a dry-land field station, and has been producing various crops. station was built in what had originally been an open-range cou Several years before it had been settled up by dry-land farmers the ranges had been broken up. In many cases the older settlers had gone there in the early days and had made money on the r did not sympathize with the development of dry-land agricultur

Here was this community of dry farmers in which this station located. The station was growing several different kinds of fo crops. The farmers asked, "What about dairying for this regi My reply was: "How many people here are in dairying?" "P tically nobody," was the answer. "How many people have m an effort here and failed?" I asked. "Several," was the ans "Can dairying be conducted here profitably?" was asked of Of course, I was compelled to tell them that I did not know. cessful dairying will depend upon their ability to produce the and market the product.

The only way I know of determining whether or not this ca done is to put a small dairy on the station farm and try it out. N I appreciate very fully ——

Mr. STEELE (interposing). Now, do not get away from Ardmo

Mr. RAWL. I am right on that now.

Mr. STEELE. Then stay there; that is good.

Mr. RAWL. Now, I like to hear people talk about cows ea their heads off, because I know that is a profitable subject. We k that the dairying of to-day is done with cows that would actu eat their heads off if the feed and labor were charged up at ma prices. Our plan, therefore, recognizing that fact, is to put a s herd of cattle there, some of which will be selected natives from surrounding community. These cows will be bred to pure bulls, in order to see and to demonstrate how to develop a profit herd, because I do not believe you will be able to buy cows ch in that region to start a big dairy business.

Mr. ANDERSON. Are you not doing that very thing right out h Beltsville?

Mr. RAWL. Yes; we are doing it out at Beltsville.

Mr. ANDERSON. What information are you getting at Ardmor you are not getting at Beltsville?

Mr. RAWL. None in this connection, but the work at Belts should be duplicated; also, there are various other reasons for es lishing the dairy at Ardmore.

Mr. STEELE. Now, doctor, I want to discuss this Ardmore prop tion with you a little. Now, would it not be possible for you, kn ing the value of dairy cows, in starting a plan of that kind to mak

ıg? In other words, if I, as a dairy man, would go out
wanted to do some little experimental work such as you
would take out there a certain number of cows that I
ld pay the expense of running that farm. Then I would
some of the off-bred stock that you are talking about
ıent with them. Now, is it not possible in all of this
l work that you are doing to make it self-sustaining? If
do that, then it is not sensible for me, as a practical
o go out there and locate on a piece of this land and
ver again the battle of life in that industry.
. Now, right there. The overhead charges which you
connection with these dairies a minute ago would be
eed—such feed as would have to be bought. To offset
be the returns from the dairy, which would go back into
. Of course, if we return $3,000 into the Treasury and
,000 to do the work, that would be breaking even. To
question that you are speaking of, you can not conduct,
abor, any dairy under ordinary conditions on a profitable
)ws that produce less than 300 pounds of butter fat a year.
k of the dairy industry in America is carried on with cattle
e less than that, and it is done profitably. This is owing
ıat these small dairies utilize labor which is available there
therwise would be absolutely of no value. The children
ings and in the evenings before and after school and the
ıg the winter months, when there is nothing else to do,
the cows and bringing in a steady return. Now, if you
a bookkeeper and said, "Charge up that labor at the
)ry pays for labor," most of the dairies would not break
ıope to be able to do efficient work, so far as it is possible,
imals that we have. My idea was to have one-half of the
)sed of selected natives and the other of high-grade,
dairy cows. Hired labor would be required, because
surplus labor that is not marketable available on the
overhead charges then, would consist of the labor,
eed, such as concentrates, and whatever supervision is
Of course, we should have to have somebody, who is
carrying on the work intelligently, to handle the herd.
LE. What production have you in this farm in the way of

L. I can not answer that. That is all in the hands of
of Plant Industry.
OR. Prof. Chilcott is familiar with that matter.
COTT. We have about 200 acres in crops.
LE. This year you had a pretty good crop?
COTT. Yes; enormous.
LE. What did you have last year?
COTT. A very small crop. In fact, this year's crop was
)od crop. We had one promising good crop, but it was
)y hail. In the six years that we have been there this is
)p that we have harvested that has been good.
LE. Of course, this year in South Dakota it was easy to
) on any kind of land. For instance, one man sowed oats
)f land that had not been plowed for nine years. He just

T OF DR. WILLIAM A. TAYLOR, CHIEF OF THE UREAU OF PLANT INDUSTRY—Continued.

EN. Is it not a fact that your dry farming has developed ning in recent years?
E. This is only for this year.
EN. This is more than one project. Is it not a fact that ing for $2 or $3 an acre in Nebraska and Kansas a few now producing crops and selling at $20 and $125 per advantage is being taken of the rainfall, but that if we e dry season again we will be exactly where we were far as the production of these crops is concerned?
R. I think this would be a fair statement, Mr. Haugen, ies of moist years has resulted in a movement westward es of dry years has driven that movement back a part of not all of the way. What has been learned through expe- ere has enabled the farmers to hold the agricultural fron- vest with each of these—to the people—very expensive because many of the people have lost practically all that but they have learned a great deal, and there has been a mulation of experience which has pushed the frontier far-

E. In other words, while industry and intelligence have a do with farming, yet without moisture you can not grow t was fully illustrated in Kansas a few years ago. They lligence, but they did not have the rainfall, and they had k. That may be true in other localities also. We hope t, but it may be the fact. Now, why should we go out end a large amount of money encouraging the people to re when this uncertain condition exists? Another thing, Mr. Rawl, is that the bulk of the cows are now milked at ne dairy business is a losing business, why should we con- ue these expenditures and continue this duplication—not eral Government duplicating the work done by the States, f that putting up stations, silos, barns, and mansions all ntry at the expense of the Federal Government?
OR. Considering the fact that everybody does a certain work at a loss, so far as the books would show, I suppose s that we have to continue to live and cash in a certain f our labor at a loss—at less than book value—and con- the things that we require for our subsistence. That ap- extent, to practically all of our agriculture. The cir- however, as we see them with reference to the territory this work, are these: That the people are there, their all here, and they are bound to stay there unless they starve we believe that it is possible to have them thrive there in run—not to get rich quick, but to live and thrive. But know the details of how this is to be accomplished, and s. The States are not doing it. As a matter of fact, e matter is discussed with them, they are urging the de- undertake this type of work, which is harder than they l to undertake. So that it constitutes, when we take all into consideration, a field of investigation which is im- large number of people who are where they can not get

L. In the larger aspect of this subject, if it had not been
itable will and determination of the men who have gone
battled with the elements and with the conditions with
ame in contact, to-day the frontiers of the country on
d be Iowa, and, because of the fact that they have gone
l battled with what seemed to be conditions almost
le, we have gradually limited the area of the American
dreds of thousands of prosperous settlements and com-
been built up in that territory which was at one time
absolutely worthless. I know that is the experience
ate, and I think it is true of the entire West. It seems
that, where a man battles with the elements and against
nsurmountable conditions, somehow or other he makes
and the resources necessary to support life are developed.
. I think that is true.
N. I agree with every word of that, but that has nothing
methods under consideration.
. Now, this is a personal rather than an official state-
personally satisfied that we shall witness—at least, those
re not too old—the development of a live-stock and
in the irrigated and dry-farming areas, but it will be at
expense to those who are the pioneers in it if it is left
s to work out individually. We believe we can save
ry as a whole a great deal of money and for the farmers
of suffering and waste by determining certain of these
is in advance and at public expense rather than through
ol of experience of individual farmers.
L. You think that this problem is worth grappling
al to any other problem that you are engaged upon in
f plant Industry?
. Yes; and the fact should be appreciated that the
ie Bureau of Plant Industry in this matter is merely
agriculture developed rationally, sanely, and soundly,
nomic standpoint, as the work that we suggest here
n arguing for will be done by another bureau. But we
absolutely necessary and essential to an enduring and
griculture that these things should be done.
N. I trust that it will prove so, but, after all, we must
nsideration the existing conditions.
LL. They are changing all the time, Brother Haugen.
N. No. I agree with what you said a while ago, but
found a few spots where it is absolutely impossible for
ake a success of it. I take it that some parts of this
intended for grazing, among other purposes, and not
of farming that we are trying to force on them. Now,
those portions of the country open for what they were
and let us not encourage people to grow wheat on land
produce 10 bushels of wheat on the average and where
vice as much to raise it as in any other section.
LL. I have a locality in my State that was known for
years by the name "Poverty Flat." The people who
d were in the direst poverty, but to-day there is a sugar

that can be made to develop it in other ways than grain
We can not do anything that will determine what is farm
iat range land until we get evidence by carrying on these
i.

not wasted any money in something that has failed.
ertain experiment has not brought profitable returns in
cents does not mean that that experiment was a failure.
iore important to prove that a thing can not be done than
be done. We have demonstrated beyond any reasonable
uth or fallacy of many of the theories that were in doubt
). Many of the things that were advocated as a panacea
ls to which dry farming was heir have been demonstrated
itely worthless and not to be relied upon. That work
en worth millions of dollars to the settlers—past, present,
tive—in that section of the country.

EN. I think I have guarded every statement that I have
sely as possible, so that no one could infer that I have
the intelligence or the integrity of the department,
tlemen who have gone into those sections of the country
charmed with the excellent presentation of these prob-
reading these statements—reading the bulletins and
ontact with the department along this line—they have
vhen, if it had not been for these statements, they would
one there. I have never said that the department urged or
) anybody that they should go there, but they have held
at possibilities in that part of the country. First, we
iat it had not been possible to make a success of the dairy
t there under the most favorable conditions, and here
iave been told, "Give us a little money and we will go
nd demonstrate that it will be a success," and at the
you admit that the conditions are most unfavorable.
iairman, I have taken up so much time, and will take no
time except to say that these settlers have been charmed
iged by the most excellent presentations made by the
of Agriculture.

IRMAN (interposing). I think, as a matter of fact, Mr.
fairness to the statements that have been made, that you
ito the mouths of the witnesses things that have not been
nk the proposition is to find out whether dairying is a
roposition here, and I do not think that I have heard any
iat it would be profitable. They want to find out whether
rofitable. Is that so, Mr. Rawl?

L. Yes. What I intended to say was that the bulk of the
cts were produced by cows that would not be profitable,
devoted to the handling of them and their product was
at marketable rates. In other words, if a cow produces
)0 pounds of butter fat, and market rates are paid for
an not as a rule declare a profit. The majority of our
do not do that, but the dairies are profitable in that they
ale of a lot of labor and feed that would not otherwise be

I know of cases in which cows are not producing more
250 pounds of butter fat a year, and yet they are abso-
able to the farmer.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Tuesday, February 29, 1916.

mittee met at 10.30 o'clock a. m., Hon. A. F. Lever presiding.

RMAN. Gentlemen of the committee, I have asked the to meet this morning to hear Dr. Kellerman, of the Bunt Industry of the Department of Agriculture, who has ıde a trip into the citrus fruit belt of the country, espe- ɜ State of Florida. I have asked him to come before the and make a report upon what he discovered there and to ıuggestions he has to make to the committee relative to tion or checking of this disease. We will be glad to hear Dr. Taylor or Dr. Kellerman.

'T OF MR. KARL F. KELLERMAN, ASSISTANT CHIEF OF THE BUREAU OF PLANT INDUSTRY.

OR. Mr. Chairman, I think Dr. Kellerman, who has were, direct from the firing line, will be able to give you and more interesting information than I.

RMAN. Then we will be glad to hear Dr. Kellerman. I ntlemen, that I think all we need to ascertain in this hear- Dr. Kellerman has learned on his recent trip through the belt and get his suggestions in regard to the appropria- ɜ eradication or control of the disease of citrus canker. n a general way, from statements of gentlemen who have ɔeared before the committee, which statements have been he hearings, what the nature of citrus canker is and its . What we are trying to do now, Dr. Kellerman, is recommendation in regard to an appropriation for the and control of the disease and what you think of the general in reference to this particular work.

ERMAN. Mr. Chairman, the trip I have made has been a y one, but I have gotten in touch with all of the Gulf coast n, devoting a little more time to the States of Florida ına than to the other States. The citrus-canker condi- mewhat more favorable than I had supposed, judging from that have been coming in during the past several months. ɛ of eradication of canker has been continued very much ines that have been discussed before your committee at arings, and there seems to be a feeling of greater confidence ɜ the men who are carrying on the actual work of inspec- radication and, what I think is really more important, growers themselves.

There is good ground for the hope that citrus canker can be eradicated. The most favorable situation now exists in Florida, where at first the disease appeared to be most widespread and most dangerous. There is almost no disease there now. There have been only a few recent cases, and those diseased trees have been somewhat isolated, and, of course, were promptly destroyed. There have been no outbreaks reported, I believe, in the past 10 days, and up until about that time there had been almost a month when no outbreaks were reported.

It is undoubtedly necessary to continue the work of inspection on at least the scale on which it is being conducted at present, and if really thorough economical work is to be planned for, the inspection work must be considerably increased throughout the entire region.

That, I think, is perhaps the only special message that I have to give, and, unless there are some questions which members of the committee desire to ask me, I think that is about all I have to present.

The CHAIRMAN. Doctor, the deficiency appropriation bill allowed you an appropriation of $300,000. That bill, I believe, was signed yesterday. Do you expect to need all that money before the beginning of the next fiscal year, at the present rate of expenditure?

Mr. KELLERMAN. No. The $300,000 was estimated for with the hope of using the money throughout the months of January and February, as well as during the remaining months of this fiscal year. With this delay, of course, there is some surplus over the original amount planned for. We would not need to use all that money between now and the 1st of July.

The CHAIRMAN. In your judgment, how much surplus would you have at the beginning of July out of this deficiency appropriation?

Mr. KELLERMAN. Approximately $100,000. It may be somewhat more than that. It depends on how rapidly we can get the force increased in the different States.

The CHAIRMAN. You will spend out of this fund about how much a month, doctor?

Mr. KELLERMAN. About $50,000 a month.

The CHAIRMAN. You think that is as much as you can spend economically and wisely?

Mr. KELLERMAN. Somewhat more might be spent to advantage, but it is really very difficult for us to estimate the optimum expenditure at this time. We do feel sure that the expenditures up to the present time have been a little too small to enable us to get really satisfactory results. The most that has been spent at the present time is about $25,000 a month, in Florida.

The CHAIRMAN. You say your difficulty at the present time is in ascertaining the maximum amount that might be spent in order to do the most good?

Mr. KELLERMAN. Yes.

The CHAIRMAN. Is it not a fact that this whole situation is more or less in a sort of hazy condition, as to what is best to be done, or what can be done, or how much can be expended? That is, you could not say definitely in dollars and cents, to the exact penny, just how large an amount could be spent wisely or how small an amount would be adequate if spent wisely? It might be possible a year after you get into the work, with a larger fund, that you would want less than $50,000 a month? That is, it might prove to be the case after you

into the work that you might find that less than $50,000
ght be adequate if wisely spent on this work?
ERMAN. Within rather wide limits, that is true.
RMAN. That is what I am trying to get at.
ERMAN. We know we should have to spend a considerable
onth, probably in the neighborhood of $50,000.
RMAN. You might be able to spend $60,000 wisely, and
ou might accomplish some very good results by spending
) a month.
ERMAN. That is true.
RMAN. If you shall have remaining $100,000 out of this
propriation at the beginning of the next fiscal year, how
l you estimate you would need during the next fiscal
y you up at least to the beginning of the next session of

ERMAN. We have discussed the question of the develop-
campaign with the Secretary of Agriculture, and I think
mplete agreement that it would be necessary to carry the
ly to the opening of the next session of Congress but
end of the fiscal year. With that understanding, and
o on support from the States, which we believe will be
th from the standpoint of focusing the attention of the
he magnitude and importance of the problems and be-
natter of equity, the importance of protecting the indus-
arge degree a local matter. For those reasons, we think
)0, in addition to whatever sum may be available from
), and counting on State participation to a considerable
give us adequate funds for carrying on the work until
17.
RMAN. That means a carrying on of the work in all the
it not? You are not confining your efforts to one State?
ERMAN. This work is for the entire Gulf region.
EY. That would be a little more than $30,000 a month?
ERMAN. Less than that from the department, but, count-
what similar funds from the States, we would have some-
50,000 a month altogether.
RMAN. My thought a moment ago was that you estimate
50,000 would be sufficient to enable you to use at least
onth up to the assembling of Congress in December, that
y to December, which would be six months. The sum of
uld be a little more than $50,000 a month for that time.
LEY. From July to the 1st of December would only be
nonths.
RMAN. That is true, but that would give you more than
ionth. What I had in mind was this, that in the mean-
g this amount of money, with your organization perfected,
in a position to know at that time better than at the
e just how much money you will need to clean up the
tion. Is that true or not?
ERMAN. Of course, that is true. We will be in a very
r position to make almost final estimates of what our
ould be. I think, however, it would be better for us to
rrying the work up to June 30, 1917, instead of only up
December, 1916. It seems to me to be rather bad policy

ıd, your funds would be exhausted before the next session of ress; and, if you had to depend upon a deficiency bill to furnish he necessary funds which you were not able to get before, then work would be greatly injured by reason of the fact that you d not be able to continue the effective work which you would ıecessary to be done. Is that not the situation?

. KELLERMAN. Yes. Any prolonged cessation of work will ost certainly destroy the value of all the work. It is necessary t we keep the campaign a continuous campaign of inspection and dication.

Mr. JACOWAY. Doctor, what progress are you making in treating is disease? Do you know any more about it than you did a month o?

Mr. KELLERMAN. Yes. The progress in the methods of eradication s been slight, but what little progress has been made has been very eful. We know now that the disease is carried by men on their oes, and additional precautions are taken in disinfecting in order to oid any possibility of spreading the disease. Nor is the disease lled by drying. But aside from that there is practically no new formation. About the only thing we are certain about now is that e disease is the most contagious of any plant disease, and we see o hope of controlling it by sprays or other ordinary methods.

Mr. JACOWAY. Doctor, I would like to ask you whether the cool, ry weather at the present time is having a tendency to retard or urb the disease?

Mr. KELLERMAN. Very decidedly.

Mr. JACOWAY. Then wet or damp weather increases it?

Mr. KELLERMAN. Yes.

Mr. JACOWAY. Then your idea is that in order to stamp out this disease you ought to be furnished with sufficient funds to treat the situation immediately, as the conditions arise? Is that your idea?

Mr. KELLERMAN. Yes.

Mr. CANDLER. Doctor, would it not be a safer and a wiser plan to ask for enough money at this time to enable you to run through the entire fiscal year, so that there would not be any question as to whether or not you would have a sufficient amount to carry you through the entire year?

Mr. KELLERMAN. The estimate we have made is for the entire fiscal year. That estimate of $250,000, with whatever may be left over of the $300,000, is based on the supposition that we will have something over $300,000—probably $350,000—to expend during the fiscal year. We believe that should be sufficient to carry on an effective campaign from July 1 of this year until June 30 of the coming fiscal year, under the conditions that obtain now, and counting on state participation.

Mr. DOOLITTLE. Doctor, how much is being spent now by the Federal Department of Agriculture in its campaign against citrus canker?

Mr. KELLERMAN. No money is being spent by the department at the present time. The funds that were appropriated last year for cooperative work with the States were almost completely exhausted by the 1st of July, 1915.

Mr. DOOLITTLE. They were exhausted in the work done in connection with the eradication of citrus canker?

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

Mr. [illegible]

tee in previous hearings—that is, the method of burning the

ELLERMAN. That is the only satisfactory plan we know of.
AWLEY. I understand this is a problem of eradication and of control.
ELLERMAN. Yes.
AWLEY. What will be the situation of the problem on June 30, ar, after you have expended the funds proposed to be appro- ? That is, how near will you be in sight of the eradication isease?
ELLERMAN. I believe we should have the disease almost y cleaned out, back to the Louisiana district. The Louisiana nd the Gulf region of Texas adjoining will probably be the fficult regions to inspect, and I suppose it will take a longer find all the disease there and therefore a longer time to e it from that territory. We believe we can locate almost s of the disease in Florida, Alabama, and Mississippi during ing 14 months. But at the expiration of that time we will ssential to continue inspections even in this territory that will be cleaned out. There are almost certain to be occa- oints where we have the disease almost cleaned out but irely cleaned out; where the disease might be reestablished e not found during the next season and burned out again.
AWLEY. Is that due to the fact that the trees have not devel- e disease so that it would be distinguished or to the fact that ople refuse to have their trees destroyed or refuse to coop- the eradication of the disease?
ELLERMAN. That is almost entirely because of a failure to e the disease in the early stages; especially during unfavor- ather the disease may get a very slight start and be indis- able. It would appear from our records that the disease nain indistinguishable for several months, although under owing conditions I doubt whether that will happen.
AWLEY. Do you have any difficulty in getting the growers oy their trees?
ELLERMAN. Occasionally we do have difficulty with the ; but that difficulty with the growers came almost altogether rst few months. There are very few growers now who are ious to have diseased trees destroyed at once.
AWLEY. Have the State authorities in each of the affected uthority to destroy the trees, whether the grower desires stroyed or not?
ELLERMAN. Yes. In all the States concerned the State laws uate to compel destruction.
AWLEY. So that in your cooperation with the States you in your power to eliminate the disease?
ELLERMAN. Yes; there is ample power.
UBEY. Doctor, you have an emergency appropriation now e of $300,000. Suppose we make this appropriation of), can you give the committee any idea of how much money available from the States for work in connection with the ion of citrus canker between now and June 30, 1917?
ELLERMAN. Unfortunately, we can not give you a satisfac- imate of what State funds might become available. We can

LETTE. There is enough for about two weeks' work left.
AIRMAN. That would be about $25,000, would it not?
LETTE. Yes.
LSON. Doctor, how much has the Government expended up this disease?
LLERMAN. About $35,000.
UGEN. As I understand you, you say that with the appropri-250,000 you would expect to eradicate the disease in a num-ates. If the committee should double the amount, what do with the additional $250,000? You spoke of a number where you expected to eradicate the disease.
LLERMAN. The inspection work in all the States could be and the work could undoubtedly be accelerated.
UGEN. It could be largely increased, I suppose. The ques-uld it be better for Congress to appropriate a lump sum, so could do this work in a short time? Would it be better to as the foot-and-mouth disease is handled and to eradicate very start regardless of the expense?
LLERMAN. Yes, except for the supposition, Mr. Haugen, an handle practically the optimum work with this sum.
LSON. Are you prepared to make use of a larger appropria-ave you the men and facilities with which you could increase t?
LLERMAN. Of course, we have not at the immediate present. bly would not have great difficulty in finding additional e facilitation of the work depends almost entirely on men. ld be merely a question of bringing in more men and nore men as efficient inspectors.
AIRMAN. I think it is important, in line with Mr. Wilson's to inquire how long it takes you to train a man before you ate him into an inspector upon whom you can rely?
LLERMAN. The average time will be about a month. A can not be taught to recognize the disease on citrus trees—uish between canker and other diseases—in that length of to work in the proper way would be considered to be too the work.
AIRMAN. This man would have to have some training as a f diseases. You could not take the average layman and to make that distinction in that length of time, could you?
LLERMAN. Yes. Some of the very best inspectors are men had only a little general experience in handling citrus who have had no special training at all in the study of ases. It is more a question of critical eyesight than of raining.
UGEN. Would the appointment of such men be merely a appointment, or would he have permanent employment?
LLERMAN. It would be temporary.
UGEN. Their services could be dispensed with after the n of the disease had been completed?
LLERMAN. Necessarily.
NDLER. Would it not be a good idea to attack the disease ate it at the very beginning?
LLERMAN. Yes.

Mr. HAUGEN. In your opinion, which course would it be best to pursue, and which course could be pursued most economically?

Mr. KELLERMAN. It is difficult to answer your question categorically. We are anxious to eradicate the disease as rapidly as possible. We have estimated for what we believe to be the smallest sum which it is safe for us to depend on, but under this sum, and contingent on State participation, we believe we will have adequate funds for a successful and a properly managed campaign.

Mr. HAUGEN. I believe it is fair to assume that everybody wants the disease eradicated, and it is just a question of which is the best course to pursue. You have been in the field and given the matter a good deal of thought and attention, and as yet you have not reached any conclusion as to exactly which would be the most advantageous plan to pursue?

Mr. KELLERMAN. I think I can answer your question in this way. Our present plans, which we believe are adequate for the most effective campaign against citrus canker, will require about the sum we have outlined. If additional funds were provided, it would probably not make much difference in the campaign as we have planned it.

Mr. HAUGEN. In dealing with the foot-and-mouth disease the department has taken the view that the best thing to do is to eradicate the disease at once, without regard to the expense. How does this differ from the foot-and-mouth disease?

Mr. KELLERMAN. It is very similar.

Mr. HAUGEN. I am curious to know why there should be any difference in policy in handling this disease.

Mr. RUBEY. In the foot-and-mouth disease the States pay half the cost, and we are not anticipating any such arrangement in connection with this proposition.

Mr. CANDLER. The various State legislatures would not be in session for a considerable length of time, and consequently there can not be any State appropriation made. What would you do in that case? Would you give credit to the States and take into consideration money heretofore expended by the States in the apportionment of funds for the work in each particular State, or would you stay away from such States until an appropriation was made by the State? What course would you pursue in that case?

Mr. KELLERMAN. I think we have precedents for entering into agreements with those States on the supposition that they will provide the funds at a later date, and I presume that would be our attitude. That is a matter concerning which I am not sure whether I know what the Secretary's point of view is.

Mr. MCLAUGHLIN. In such a great emergency a special session of the State legislature might be called.

Mr. KELLERMAN. That would be very difficult, especially in the States of Alabama, Mississippi, and Texas, where the citrus industries, although perhaps promising industries, are not of great magnitude in comparison with other industries in those States.

Mr. MCLAUGHLIN. And the governor of the State might refuse to call a special session of the legislature for that purpose?

Mr. KELLERMAN. Yes; that is true.

Mr. YOUNG. I am sure that is true so far as Texas is concerned.

The CHAIRMAN. Mr. Harrison, of Mississippi, desires to ask one or two questions, Doctor.

ARRISON. Doctor, is the situation in regard to citrus canker it was in December of last year, so far as citrus canker the citrus fruit industry in Florida, Alabama, and Mississippi ned?

ELLERMAN. It is much the same, except that I think there a distinct improvement in the State of Florida. I do not re has been much change in any other State.

ARRISON. Do you think that about $800,000 would be to run a citrus-canker campaign for 16 months. I gather ir statement that you are counting on a deficiency appro- of $300,000 and then counting on an appropriation from mittee of $250,000. You said you also expected there would 000 or more from the States, which would make the total bout $800,000. How do you reconcile that statement with r of the Secretary of Agriculture, submitted on December hich he makes this statement:

r present knowledge, any effective campaign of eradication will depend pon the prompt and thorough inspection of all citrus properties throughout gion and the immediate destruction of infected trees, and perhaps the destruction of adjacent trees that may be supposed to harbor the disease. effectively this wide area within a few months will require a large force of in each of the Gulf States, and especially in Florida. It is estimated that at least four years to stamp out the disease, and that an aggregate expend- ll sources—Federal, State, and local—of about $4,000,000 will be required. ed that an adequate force of properly trained inspectors, including neces- es, travel, and other expenses, may cost during the first year $1,300,000. nates, of course, are not final.

cretary of Agriculture estimates that for 12 months it would take $1,300,000. You estimate it would require about for 16 months? How do you reconcile these statements if tion is practically the same as it was when that letter of the r was written in December?

ELLERMAN. Both estimates are merely the best guesses that made of what funds probably should be provided for the ective work in eradicating the disease. The larger sum of 0, I think, was really intended to cover a longer period than hs. I think it was the intention to count that for the 18 rom the time the letter was written—that is, until the end of fiscal year.

ARRISON. He says it would cost in the first year $1,300,000.

ELLERMAN. That is the way the letter reads. I think that is is what the Secretary had in mind, however, and I think hat Dr. Taylor and I myself had in mind when we discussed ation at that time with the Secretary. Even at that, the is somewhat higher than it is at the present time. That is ue to the fact that the proposed campaign is necessarily a in starting, as the other funds were not provided as promptly d hoped in the urgent deficiency bill, and therefore, instead ning to formulate a large campaign on the 1st of January, ist doing that now. And, secondarily, this estimate differs first estimate in being an attempt to make the minimum that we believe to be safe.

OOLITTLE. Did you have more information at the time you e first estimate than you have now?

ELLERMAN. No; I think we have rather more now.

Mr. SPARKMAN. In order, then, to protect Florida and California, disease should be eradicated in every other State?
Mr. KELLERMAN. That is certainly the wisest plan.
The CHAIRMAN. I would like to ask you a question in line with Col. rkman's first question. You say you have now no more knowl- e of citrus canker than you had in January of this year, or the r past, even. But, as a matter of fact, in the work it is proposed do, it is not a question so much of the study of the disease as s a question of the study of plans for controlling the disease, you do feel that at this time you are in a better position to out- an effective campaign against the spread of the disease than were 12 months ago? Is that true?
Mr. KELLERMAN. That is true.
Mr. LEE. Have you heard any complaints from Arizona or New ico?
Mr. KELLERMAN. The disease has not reached those States.
Mr. HELGESEN. In your plan do you contemplate reimbursing the wers for the trees?
Mr. KELLERMAN. No.
Mr. MCLAUGHLIN. You were speaking of the work you expect to in Florida and Alabama. Do you expect to do any work in isiana, Texas, and Georgia?
Mr. KELLERMAN. Yes. It is not a question of work, however, but speed of the work in those three States. In Alabama and Missis- i inspection will be very much simpler, and naturally we ex- t to be able to get over that territory more quickly.
Mr. MCLAUGHLIN. Do you expect to do any work in California?
Mr. KELLERMAN. We will do no work in California, Arizona, or w Mexico unless the disease should appear there. So far as I w, there is no reason to believe that the disease has gotten west of as at all. I do not mean that we will reduce our work or that we not work in Texas or Louisiana, but we will probably have to have re time in those two States, because of the area involved.
Mr. LESHER. Are the growers there becoming educated to the ation? Where they find the disease in an orchard, do they try tamp it out themselves, or do they wait for the inspector to come re and eradicate it for them?
Mr. KELLERMAN. In most cases the disease is merely reported. re has been such a decided emphasis placed on the possibility of spread of the disease through any carelessness in handling the ased trees that there is a very general feeling that the diseased s ought to be let alone until the inspectors come in.
Mr. HELGESEN. If the Federal Government is largely going to do eradication work in the Western and Gulf States, where the ustry is not so extensive, would it not be reasonable for the States ocate the disease, wherever it may be, if the Federal Government eradicate it?
Mr. KELLERMAN. The inspection and eradication of the disease uld go hand in hand. In the infected regions the inspection squad the burning squad must be within a few miles of each other.
Mr. HELGESEN. Would you propose to carry a large burning squad re there was no disease?
Mr. KELLERMAN. We are more likely to have a small burning ad as a trailer to an inspection squad.

ELLERMAN. It is hard to say whether more money should be

AUGEN. A large amount would not be appropriated to dis-
ge, would it?
ELLERMAN. I can see no disadvantage.
AUGEN. If we are going to stamp out this disease, the ques-
ıy mind is how quickly we can do it, and I think the quicker
the better. That is my idea about it.
AWLEY. I want to ask Dr. Kellerman to state what fruits are
by this disease?
ELLERMAN. Practically all the citrus fruits. Grapefruit is
the worst, but lemons and limes and round oranges are also
attacked.
AWLEY. The round oranges are the regular oranges?
ELLERMAN. Yes. The tangerine orange is not quite so
attacked as the ordinary type.
HAIRMAN. We are very much obliged to you, Dr. Kellerman.
received a letter from the Secretary of Agriculture in regard
proposition which I will ask the clerk of the committee to

lerk read as follows:)

DEPARTMENT OF AGRICULTURE,
Washington, February 28, 1916.

. LEVER,
of Representatives.

R. LEVER: With reference to our recent conversation concerning the scope
k directed toward the eradication of the citrus canker disease from the Gulf
the funds necessary during the fiscal year 1916–17, I have considered the
t evidence obtainable from the infected centers both regarding the extent
ribution of the disease and the attitude of the citrus growers and others
he infected regions. The desirability of continuing cooperative work with
States concerned appears to be unquestionable, yet only approximate esti-
e necessary activities and the cost of these activities in the different States
. I recognize that there are plausible and perhaps valid arguments for the
appropriation of a large sum of money to be available until expended,
gh the exact total of the expenditure is problematical, as is the duration of
ation campaign against the disease. A more permanent organization and
unity of securing a higher grade of employees for inspection and supervision
r, as well as a more comprehensive outline of the entire campaign, are some
ious advantages under this method.
he opinion, however, taking into consideration all the known factors regard-
, that our wisest course is to plan at this time for a vigorous prosecution of
t eradication campaign only throughout the coming fiscal year, leaving
ination from experience secured within the coming 12 months decision as
unt that will be required for the work after that time.
the further opinion that it is essential that the States concerned bear a
ortion of the burden of continuing the eradication campaign. With appro-
reasonable contribution by the States to the cost of the work, a Federal
ion of $250,000, in addition to the $300,000, which will be available upon the
the urgent deficiency bill, is estimated as sufficient for the work to June
The following language would give adequate authority for this purpose:
nducting such investigations of the nature and means of communication
ase of citrus trees known as citrus canker, and by applying such methods
ion or control of the disease as in the judgment of the Secretary of Agri-
ay be necessary, $250,000; and the Secretary of Agriculture is authorized
h expense and employ such persons and means, in the city of Washington
here, and to cooperate with such authorities of the State concerned, organi-
growers, or individuals as he may deem necessary to accomplish such

truly yours.

D. F. HOUSTON, *Secretary*.

as the Secretary of Agriculture has recommended. The
s of the Agricultural Department will not spend any more
s necessary. You can trust them in that regard. You can
l on the Department of Agriculture being as economical as it is
e to be, and if you leave it to them and put a sufficient sum
eir hands with instructions to eradicate the disease it will be
ated. There is no use of temporizing in a matter of this kind.
go at it right or not at all.
ank you, Mr. Chairman.

EMENT OF HON. EVERIS A. HAYES, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA.

HAYES. Mr. Chairman, I only want to say a word. I want to
at California as yet has had no evidence of this disease in any
citrus groves. Our people are maintaining a very rigid quar-
, in order to prevent the disease getting a hold there.
they are in a state of great apprehension lest it may get a hold
State.
nt to second what Mr. Sparkman has said and say that I believe
ght policy is to make such a vigorous campaign against this
as to stamp it out without delay. That is the only safe
l for the protection of the citrus industry of the country, and
the appropriation you make will be sufficient to enable the
ment of Agriculture to conduct a most vigorous campaign in
to put an end to this menace as soon as possible. I believe
00 is much too little, as I understand the situation, and I hope
mmittee will make an appropriation at least twice as large as

MENT OF HON. WILLIAM J. SEARS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA.

SEARS. Mr. Chairman, my district, I presume, is more largely
d by this disease than any other district in Florida. I have
hat I could to secure appropriations, and I want to congratu-
e Department of Agriculture on their conservative estimate.
s only an estimate.
nk the committee can readily see that unless a large amount
k is done in our State the money will not do us very much

o believe that unless this work is carried on vigorously in
and other States a large amount of this money will be wasted,
e we get this disease from Texas. It has come back to us.
ople have shown what they are willing to do. It is not prob-
al what Florida stands ready to do. We have spent $300,000
campaign against this disease.
are not here begging you for anything. If we were to have a
session of the legislature, it would cost us $60,000. That
be about one-third of what a reasonable appropriation should
I believe this committee and this Congress can trust the State
ida to reimburse the Government for any appropriation which
e sufficient to meet the emergency. Our legislature does not
regular session until next April.
CHAIRMAN. You mean April a year?

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Wednesday, February 16, 1916.

committee met at 10 o'clock a. m., Hon. Asbury F. Lever
ıan) presiding.

CHAIRMAN. Gentlemen, we have the honor of having with us
ırning the Secretary of Agriculture, who will make a state-
ı his own way concerning the work of the Department of
ture, and its needs for the coming fiscal year.

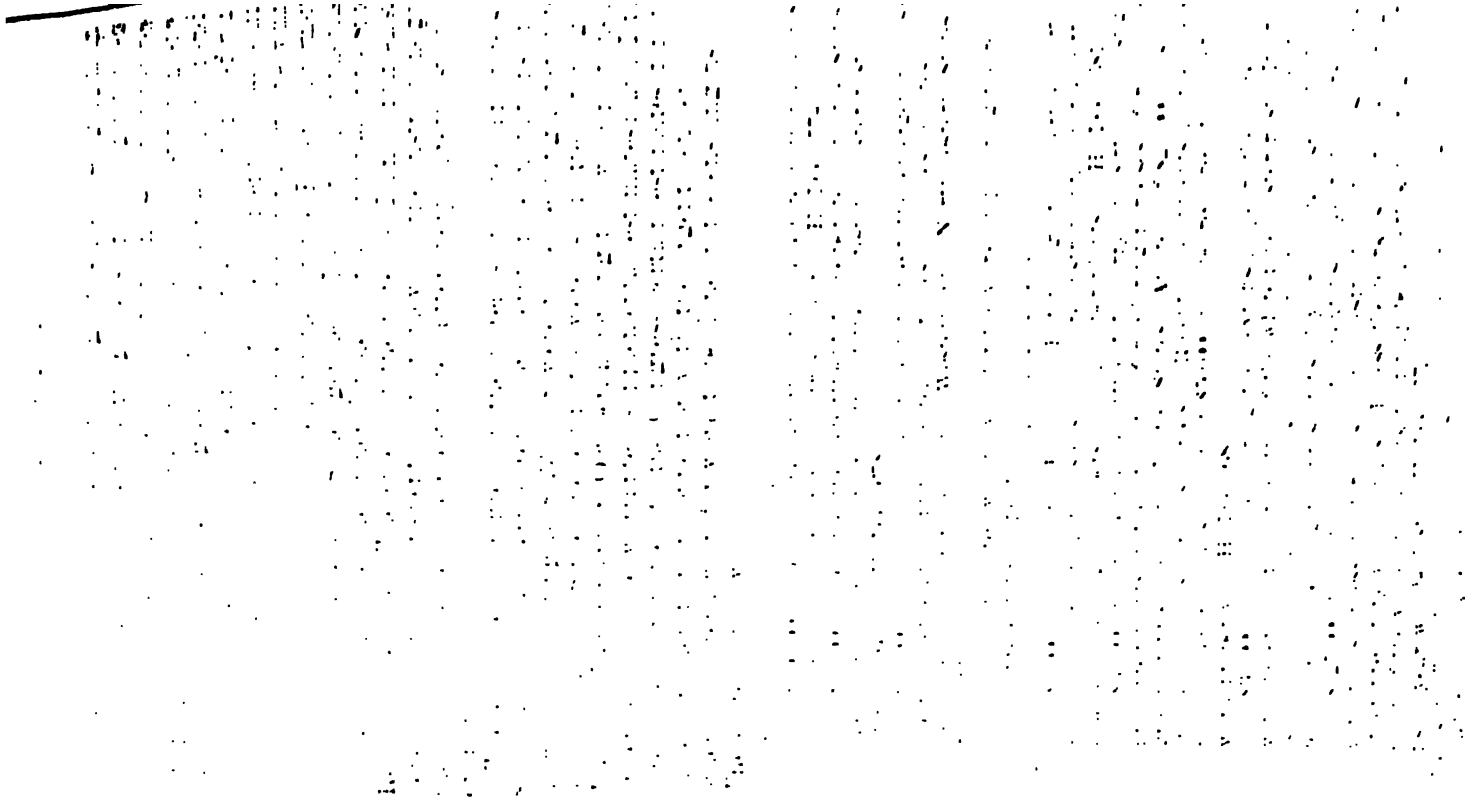
TEMENT OF HON. DAVID F. HOUSTON, SECRETARY OF AGRICULTURE.

tary HOUSTON. Mr. Chairman and gentlemen of the com-
it is a great pleasure to be before this committee. I know
u have been going into the estimates and the activities of the
ıent very carefully, and I imagine that pretty nearly every-
might say has already been said to you. It is always a diffi-
k to prepare estimates for any department. It is difficult in
times. It is especially difficult in a time of great disturb-
n passing on the estimates, I attempted not only to consider
y the merits of proposals arising in the different bureaus but
keep in mind the disturbed condition of things, the state of
enues, and the fact that the Congress would have to consider
ter of ways and means very carefully. I undertook to keep
mates down to the lowest possible amount which would enable
artment efficiently to maintain its services and in reasonable
meet demands arising in larger and larger volume from all
the Nation.

ıps I may emphasize the policy pursued by reading from a
ndum I sent to the chiefs of the bureaus:

mendations for increases shall be confined to those projects which are
romising or which are planned to meet some serious situation and to
al existing projects under which the work has a necessary natural
All projects now under way should be given careful scrutiny with the
letermining whether they should be prosecuted further and justify the
l expenditure of Government funds. Where further expenditure can
ıstified, recommendations should be made for a discontinuance of the
ıtion, or for a decrease of the funds or the transfer thereof to more
g lines of work. It may result that with a proper readjustment of the
thin each bureau and the elimination of duplication and waste the
the department can be conducted upon an efficient and effective basis
asking Congress for material increases.

nt as much time as the pressure of circumstances in the last
ıuld permit in discussing with chiefs of bureaus their various



erested in all the items of the estimates. I am especially in all the increases submitted, which were very carefully . The principal increases, taking into consideration trans- statutory roll, are as follows:

ing investigations and demonstrations, $105,451.
news service, $136,600.
ooperation in marketing work, $35,000.
r service:
tension of service, $75,000.
ection of building at Cape Henry, Va., $25,000.
ection of building in the Panama Canal Zone, $25,000.
ition of cattle tick, $219,500.
nents in dairying and live-stock production in semiarid and irri- ts of the western United States, $87,500.
nd animal husbandry investigations, $41,880.
crop investigations, $21,000.
anagement investigations, $24,390.
standardization, $37,000.
investigations, $20,000.
r experiment stations, $35,000.
stimates, $26,856.
rvey investigations, $30,000.
engineering, $13,200.
ement of the migratory-bird law, $50,940.
ement of the food and drugs act, $50,000.
ement of the insecticide act, $10,260.
ement of the plant-quarantine act, $25,000.
istrative expenses, States Relations Service, $25,000.
ngs at Bureau of Animal Industry experiment stations, Beltsville a, Md., $16,850.

ot undertake to discuss all these items. What I shall have have reference particularly to the appropriations bearing t supply and on the work in marketing.

ng, however, I should like to call your attention to the very mendations which were made for increases in statutory Some of these have been brought to your attention before, k the merits of the cases and the peculiar circumstances g them justify their favorable consideration.

ar, as in previous years, I have been especially concerned neat supply of the Nation. All the members of the com- more or less familiar with the situation. You know that last 15 years, while the population of the Nation increased the number of beef animals decreased over 6,000,000 and er of sheep nearly 11,000,000. What the explanation ate of things is I do not know, and I have not found who does. I have talked with a great many people; with men, commission men, transportation men, farmers, and State and Government service; and while I have found people with more or less definite notions on certain aspects blem, I have not found anybody who pretends yet to have satisfactory view of it or anybody who can confidently at should be done. The problem is not only one of profit- uction; it is also one of marketing. The marketing prob- elatively new, and, until a comparatively short time ago, ceived very full or systematic consideration by any State l agency.

re certain things that appear to be fairly clear and certain g which we may proceed with confidence. It is generally

than [illegible]

[illegible] that if [illegible] pe[illegible] there would [illegible] of the country. These grazing [illegible] number of animals, while they [illegible] ing number of animals. There [illegible] more animal than at present, [illegible] conditions.

Then, certainly, if we could either eradicate animal diseases, we should be able to produce animals at a lower cost or a larger number at cost. I need not go into the details because letters have been presented to you.

The cattle tick places an enormous burden, not South but also indirectly on the Nation at. The question is whether we shall get rid or whether we shall let the work drag. It is not definite continuance of appropriations or of ev but of larger appropriations over a few years for a long period. We can get rid of this nuisance expenditure in the long run if we could time required will depend on the amount of m the Federal authorities and the active coop With the proper attitude on the part of the pe from communities or from the States, or both, Federal appropriation to meet any amount th rapidly exterminate the cattle tick and get thr

As a matter of fact, partly because of the work, partly because of a somewhat vigorous the States are beginning to cooperate muc Texas, which should be vitally interested in t operated as it should have. But the indicati

their support and the Federal Government is in a position
ate effectively with them, we ought to be in a position to
the cattle tick in six or seven years. What that would
the Nation, to all people interested in the handling of live
hout quarantine restrictions, to banks, and to the agricul-
ıe Union, it would be impossible to state in exact terms.
se the request that we make again this year for an appro-
of $87,500 for experiments in dairying and live-stock pro-
ı the semiarid and irrigated districts of the western United
ems to me to deserve favorable consideration. Intensive
re requires near-by markets, or it means the perfection of
g machinery. The farmers in the western irrigated sections
n touch with large markets. A serious problem confront-
is how to market their products. To reach the market at
hese must possess high value in proportion to their bulk.
ly the farmers must utilize their products through live
omparatively little has been done along this line. Only
ıave the agricultural problems of the reclamation projects
fully studied. The marketing problem is especially acute.
like to see this appropriation favorably considered so that
ttempt to furnish assistance.
ıer large increases in the estimates are for extensions of the
g studies. Aside from the suggestion of an appropriation
the market news service, the net increase recommended for
al marketing projects is slightly over $100,000. When I was
e committee last year, and I think the year before, I re-
he committee that the study of the economics of agriculture
ely recent. I suppose no one who looks over the agricul-
ation and studies it can fail to realize that in many respects
ly marketing of farm products is our most difficult, urgent,
lved agricultural problem.
ngular, when you come to think about it, that this whole
ct of the economics of agriculture has received so little

Up to a few years ago it received no systematic atten-
er at the hands of the Federal Government, or of the State
nts, or of the students of economics in our colleges. Nearly
od university or college in the Nation has one or more,
s 10 or more, men dealing with economics. You will find
courses offered in institutions in the economics of indus-
axation, public finance, public debts, transportation, bank-
national payments, economic theory, the history of eco-
he economics of industry of the ancient world and of the
ges—but with rare exceptions will you find courses in the
s of agriculture. This is not the result of conscious or
action; it is an oversight, and there ought to be a change.
is being made. Within the last three years more attention
given to this subject than in any preceding decade, and I
, perhaps with truth, than in any preceding generation.
the demand for men who have studied rural economics
and the land-grant colleges, which naturally are interested
roblems, States which are creating marketing or other farm
s a part of their State machinery, and the Department of
ıre itself, are experiencing great difficulty in finding men

whose training and experience justify the expectation that they c
render useful service. Of course, many individuals and many organ
zations in the past have thought about these problems, but th
have not had the requisite knowledge of the facts to guide the
The farmers at times have felt that things were wrong, that the
were elements of injustice in the situation; but not knowing exac
what the abuse or evil was or what constructive action to take, he
misdirected their efforts and wasted much time and money.

The great task is to discover the facts bearing on any given m
keting problem, to form a definite plan of action, and to disc
what direction to take with certainty, with a feeling of confidence.
will be much easier to go in the wrong direction than in the ri
direction; and from the beginning the thought in my mind has b
that we should be cautious, because by going in the wrong direct
we can easily give a great movement a backset. There are m
demands for hasty actions. There are many people who seem to th
that we can solve these difficult problems overnight—that, by
mere creation of machinery, no matter what its character may
provided you get enough of it, you can solve them. Of cours
know that gentlemen here do not share this view. Machinery i
no consequence unless the men directing it know how to use it.
problems are to be attacked, and what direction should be take

There is no such thing as a national marketing problem.
there are marketing problems of tremendous national import
there are as many of them as there are crops or sections with
tinctive economic peculiarities, and there may be many proble
each section. Some would say that there is a national live-
marketing problem. The truth is there are many live-stock m
ing problems; and a man may know a good deal about one of the
very little about another, or much about the conditions in one p
the nation and nothing about them in another section. I ha
found anyone who knows much about all the live-stock proble
all parts of the country. A man may know a great deal abo
problem in the Middle West and little or nothing about it i
England. Likewise there is a problem of marketing citrus fr
California, with its distinctive features, and a somewhat
problem in Florida. There is a problem of apple marketing
Northwest. Its solution might not apply to the marketing of
in the Shenandoah Valley or to the marketing of peaches in
ware. Each particular crop in a given area may present p
difficulties. There is a cotton problem in the South. There is a
problem, which is more or less nation-wide, but which is of p
concern to the people of the Middle West and Northwest.
ously, however, knowledge gained in the study of any crop
section may have a wide or universal bearing, value, or appli
I think the machinery which has been created in the depa
with difficulty and with constant scrutiny and care is on a solid
dation. The men in charge are making good headway. Th
learning more and more what direction their efforts shoul
and are increasingly rendering assistance to producers an
tributors.

One thing which must be apparent to every thoughtful man
the farmer, no matter how efficient he may be in produ
is not necessarily an expert in marketing his products: and f

ıe undertakes to rely exclusively on himself in marketing his
is likely to be handicapped. While averages do not always
great deal they are at least significant. The average culti-
ırm in the Union to-day is 76 acres. There are considerable
of the Union in which the average cultivated farm is only
. That is the average for some of the Southern States. I
is about the average in the New England States. The average
in the Middle and Northwestern States. A man whose oper-
re confined to 34 acres or even to 76 acres obviously is going
difficulty, if he acts alone in securing the requisite transporta-
ilities, in establishing a certain type of product in his com-
in standardizing it, handling and packing, in grading it,
stablishing any sort of control over the terms of bargaining,
ing the requisite information about markets, and in deciding
send his products.

nally I can see no way out, especially for the small farmer,
hrough cooperation, through an attempt to secure more and
ity of action on the part of the farmers, with a view to de-
a particular area the same sort of product, the same type
ndard of product, to get information as to where the best
market is, to standardize handling and packing, and to
conomically the requisite transportation facilities and market
This is not a new suggestion. The cooperative movement has
made much greater headway in this country than people
. In certain directions, in certain great agricultural prod-
ery high degree of organization has been developed. They
the possibility of a great extension.

rticular, it seems to me highly desirable that conditions over
ıe individual and the community have no control, conditions
too widely prevalent for them to control, must be regulated
ı by either State or Federal action. This matter is not im-
ly pertinent to the estimates, but it is so intimately connected
work of the department and especially with the study of
ng that I think it not out of place to mention it. The condi-
verning the trading in agricultural products are what I have
. They can be bettered, but in certain subjects improvement
dent on legislation.

ally speaking, every manufacturer knows exactly what his
is; he knows what it cost him and knows it much better than
er, if he is a competent manufacturer. Generally speaking,
ıer does not know with definiteness what his product is, but
ho buy it usually do. There is a very radical difference,
e, under present conditions, between the trading in agri-
products and the trading in manufactured products. For
er there are standards and measures to go by, completely
accepted by the trade, in part fixed by law; for the former,
e only those established by custom, or none whatever. Much
ork of the department heretofore, and especially at present
ffice of Markets, has reference to the fixing of standards and
notion of conditions under which business methods will be
npletely injected into farm marketing and finance.

are measures pending before Congress which, if enacted into
ıld be enormously helpful. I refer to the grain-grades bill,

s no doubt in anybody's mind that personal contact is the best
f taking matter to any students and pupils. This act takes
rmers, men and women and boys and girls, to school while
re actively engaged in their ordinary duties.
year we had available from Federal funds $480,000; this
n addition, $600,000, making in all under the extension act
000 for the current year from the Federal Treasury. The
)0 has been met by the several States, and there are additional
from State and local sources. All this is being expended
h a coordinated and unified piece of machinery. I need not go
description of it. The offices here in Washington are cooperat-
th the States through the directors in the States, the State
in demonstration work, the county agents, and, in some cases,
ists. Aside from the fact that we are undertaking in a larger
reach the farmer, there is the fact that this act has brought
a coordination of the relations between the Federal Govern-
nd the States; and in the field of administration alone, as a
n of the problems and difficulties of dual jurisdiction, this act
to me one of the most significant measures that this Govern-
as ever enacted.
several years at every meeting of the association of land-grant
s much time was given to a consideration of the friction,
y, waste, and duplication of work arising out of the activities
eral and State agencies, and especially out of the educational
ies. This act, briefly speaking, has practically eliminated the
ties. In the first place it requires that projects shall be mu-
agreed upon by the State and Federal authorities. In the
place it provides that plans shall have been made. Formerly
things were undertaken somewhat impulsively, without due
eration and careful planning; and the two agencies not infre-
worked at cross purposes. Generally speaking, they are now
g together without friction, and the extension machinery,
representing the Federal Government and the States, is
y and successfully assisting the farmers.
eover, the way has been opened for a correlation of activities
arch work. We have offered on the part of the Federal Gov-
it to act as a clearing house for investigational projects. The
ment of Agriculture annually publishes its projects, carefully
d, with a statement of the work, its object, the force assigned
nd the money available. It sends these projects to the land-
colleges. We have asked each of them to publish its projects
lar fashion or to send them to us, and we have offered to send to
llege not only our projects but also the projects of each other
, so that there may be a national economy of effort in the field
estigation as well as in the field of education. This task of
iting waste, duplication, and friction has been one I have
t about quite as much as any other; and I believe we have
nany improvements. I have been as much concerned to bring
he coordination and adjustment within the department in the
it bureaus as I have to bring it about between the Federal
ment and the States.
he present time there are about 1,200 counties with county
There are about 400 that have, in addition, associate agents,
, who deal primarily with domestic-science problems. The

ıall not be certain about until we have undertaken to apply in the field under the requisite expert control. They are in lf way stage. The department is now doing considerable work rious communities of a semidemonstrational or semiexperi- l nature.

ne gentlemen, looking at the situation, say that there is a lack of ination; that there is waste and duplication of effort. They hy the county agent can not do everything. Their attitude from their failure to understand the peculiar and diverse char- of the work and the necessities of the situation. While there d of special agents, there is no reason why there should not be ination. We have established this relation: When we send ılists into a State we do not want them to go into that State the State authorities ignorant of it, with the extension di- and leader in that State ignorant of what they are to do. So administratively, they are put under the direction of the States ions Service, and the first thing they are directed to do is to lish contact with the State director of extension work and the leader. But as to the subject matter with which they deal, are immediately responsible to the technical experts in the r bureau. And so we have coordinated with the work provided nder the extension act, not only that sustained from the direct priations, but also the experimental extension work supported e funds of the scientific divisions.

ain, I think it is desirable that the department should have direct funds, because I believe that by means of them it can fully vitalize the whole cooperative machinery. If you were to ff these funds we should have here in Washington nothing but a administrative officers who will correspond with the various leaders or occasionally make visits. This would take up their e time. But the Department of Agriculture has, perhaps, as ı information annually to convey to the farmers as the land- ; colleges have, and in some directions more. While I believe gly in this cooperative arrangement, I still think that long- ace touch exclusively would not give the best results. This should be continued mainly to make possible for the present a extension of the county agent machinery and ultimately to ı small part of the salary of leaders and agents, and more par- rly to provide extension specialists in a number of lines in ration with the States as far as possible.

is matter was not so clear in my mind last October, when I sub- d the estimates, as it is now. I submitted the cooperative dem- ation items as they stood, without comment. Now I think that ıd of considering a reduction of the amounts it would be well to ler whether we ought not to increase the estimate for the work North and West.

e CHAIRMAN. In that connection, Mr. Secretary, I intended to ou this question when you had completed your statement, but, loes not interrupt you, I think it would more properly be made

Are you satisfied that a reasonable increase for extension work North, West, and East proper could be used advantageously at ime, with your present machinery, and, if so, how much do you that increase should be?

ELGESEN. I understand, but the question is how long should
ival be continued.
ry HOUSTON. I think there is no reason for continuing it.
remember that this work began in the South and formerly
orted by funds contributed by the General Education Board,
s by direct Federal appropriations. This work could be
in the South. Later Congress also provided money out
easury for work in the North and West. In the agricul-
ropriation act for the fiscal year 1915, Congress replaced the
und with Government funds. It did not consolidate the
nstration items. We have been acting under that authority.
time we have been seriously considering the question raised
mmittee last year and presented to me for consideration as to
these appropriations were to continue at all or were to be
It was not until after the estimates went in that it seemed
what ought to be done. This accounts for the fact that
were presented just as they stood. Now, I am clear as to
uld be done, namely, that this appropriation, for the reasons
ndicated, ought to be continued and increased so that the
y be more rapidly extended in the North and West. I am
ly in accord with Mr. Helgesen's suggestion that the items
idated and the work be done where conditions demand. It
realized, however, that on account of existing arrangements
ements, there can be little if any readjustments and no
s unless the increase suggested is made.
ELGESEN. Of course, I have perfect confidence in both the
id the honesty of the Secretary, and I would be willing to
o him to spend the money wherever the country needed
the North did not get as much as the South I would be the
to complain.
ry HOUSTON. I think it is exceedingly undesirable to have
ion of North, South, East, or West in any Federal action.
ELGESEN. That is all right.
ry HOUSTON. And so far as I am personally concerned, I
er considered matters of this kind on a geographical basis
on the basis of the problems we had to study. It makes
lightest difference to me where the work is to be done.
NDLER. Your predecessor stated on one occasion that the rea-
pended a larger amount of funds in the South than in the
is that there seemed to be a greater need for development
l for that reason he thought he could get better results than
ney was expended otherwise. That was the reason he gave.
there is no member of this committee who would not want
ent all over the country.
ry HOUSTON. As a matter of fact, I think the Secretary had
e discretion at the outset. This fund was given to the De-
of Agriculture to be expended in the South, because it was
hat conditions there were exceedingly critical and there was
need for action. The situation was complicated and intensi-
e presence of the boll weevil and the threat that it constituted
tunes of the Nation as a whole. Mr. Helgesen is perfectly
saying, as I understood him, that the problem of the boll
w is largely a problem of good farming, that we shall prob-

ary HOUSTON. My thought, Mr. Chairman, is that it will be
ed, not withdrawn or reduced. At present we are paying a
he salaries of the county agents. We shall probably pay less
salaries, continue to pay part of the salary of district and
aders, and provide well-trained specialists in a number of sub-
cluding marketing, in each State.
HAIRMAN. The clerk of the committee has furnished me with
ent which might be interesting at this time. When the exten-
is in full operation there will be available from Federal funds
00 annually and from the States $4,100,000, making a total of
00. Now, with 2,850 counties, that would make available for
nty annually the sum of $3,045.
ary HOUSTON. Yes.
HAIRMAN. So that until this fund has accumulated it seems
—
ary HOUSTON (interposing). Mr. Chairman, may I add just
here?
HAIRMAN. Yes.
ary HOUSTON. To that amount should be added the contribu-
communities.
HAIRMAN. That is true.
ary HOUSTON. As a rule, we are now paying part of the sal-
he county agent, where we have the cooperative agreement,
many cases, of an associate agent, a woman (the demand for
growing). Part of the expenses as well as of the salary has
d out of local funds. The remainder is paid out of Lever Act
It would require more than the amount you have named to
his demonstration machinery in the proper way to all parts
nion and to maintain it.
HAIRMAN. Undoubtedly.
AUGEN. Can you give an estimate as to the number of coun-
hich it would be necessary to carry on this work?
ary HOUSTON. Yes.
AUGEN. I take it in a large number of counties it would be un-
y, because many of them would be in national forests and in
t.
ary HOUSTON. It is estimated that about 2,850 will need
gents.
AUGEN. I think the total number of counties is 2,850.
HAIRMAN. No; 3,000.
ary HOUSTON. There are 3,004 counties in the Union.
AUGEN. It has been stated that the number of counties was
300; that was stated a number of times.
ary HOUSTON. My recollection is—I may be wrong—that the
of counties is over 3,000. About 150 of them are not rural

ELGESEN. Did I understand you to say that in some instances
all of the salary of the county agents?
ary HOUSTON. Yes; in three cases; but as a rule we do not.
ter part, as a general thing, is paid out of Federal and State
ising under the Lever Act. Part may be paid from com-
funds.
AUGEN. You have a uniform plan now and treat them all

HEFLIN. The difference is that he calls it a farm-produce ex- and you think that the work of this Office of Markets will be e as the work that would be done by that exchange, and that not need additional authority?

tary HOUSTON. I do not remember what Mr. Sumners's bill s. My own opinion is that the department is proposing to pro- ng the right lines. We are getting at the facts. We shall n more and more completely and furnish information in- ly. After the information is available, individual farmers ups of farmers in communities must apply it as they have in ion. It is not contemplated that the Government will actu- rket products.

TUBEY. This whole matter must, of necessity, be a gradual de- nt to reach it just as fast as you can and not be compelled to a great, enlarged work which you would not be able to at once.

tary HOUSTON. Yes. There have been many ambitious sug- . Some wish to create a national marketing commission, ubordinate commission in each State, one in each county, and in each township. Suppose we had them. What would they do not know. Certain things might be suggested here and ut I imagine these commissions would either do very little ng time or do many ill-considered things. It might, perhaps, difficult to educate the commissioners to do their job than it e to go out and educate the farmers. I think we would save going directly to the farmers as we have in matters of pro- and already in instances in matters of marketing. We do t any additional machinery or burdens at present.

HEFLIN. The farmer who produces potatoes, tomatoes, and d various things of that kind, wants to know where he can arket for his products.

tary HOUSTON. Exactly.

HEFLIN. And the work of this Office of Markets will, after a give him information as to where the markets are and what oduce brought the year before, and so on?

tary HOUSTON. I think it will. We have asked for $136,600 d the market news service. This is intended to do what you We have been doing it experimentally on a small scale with The market news service should give information as to the of a particular product in a given area available for con- n, what markets exist, what the conditions are in the differ- kets, and especially in the near-by markets, to prevent waste hauling. Groups of producers should know daily what the conditions are and where they can ship to the greatest advan- This is particularly necessary for producers of perishables.

ACOWAY. Do you do that now?

tary HOUSTON. Yes; as far as experience and funds permit.

JACOWAY. For instance, take the Elberta peaches. Do you the farmer by telegraph where he can find a market for those ?

tary HOUSTON. That was done in an experimental way last r a number of perishables. We are asking for an item of) to extend the work during the coming year.

Mr. JACOWAY. We shipped a carl
my State to Chicago, only to be infor
glutted, but that we could have found
them to another market of which we d
Secretary HOUSTON. You know h
change handles oranges?
Mr. JACOWAY. I am not familiar wi
Secretary HOUSTON. It has a highl
and furnishes its members informa
several times a day by telegraph, tel
be that in time, as this work proceed
a similar service to groups of prod
country, at least by way of demonstr
selves, just as the Californians do, la
That is the direction of effort of the
But a news service is just one featu
is complex and reaches back to the ve
think the time will come when no int
produce a thing until he knows fai
it when he gets it. Heretofore, far
ahead and produced things without
could do with them. The country i
have produced perishables, consigne
many instances, have had to send mo
There are so many aspects of the
is difficult to get a complete view of
is to conceive it as a whole, from t
until the consumer is reached; and it
in any other way. It requires the j
many agencies, both in production
farming population with the requis
marketing problems arise out of the si
we are still in a developmental, pi
The problems of marketing where t
usually so acute as those in a new
opened up and especially where the
been, under the direction of real est
is to get people on their properties.
eration to what they can produce or
and in such cases the markets are ge
be a great blessing if some State or c
could be provided to furnish responsi
up the newer areas.
Because production and marketing
ure, it is highly desirable that agenci
keting problems and for the dissemi
in intimate and organic contact with
whether they be State or Federal a
telligent action, to rapidity, to econo
In the task of furnishing information
in considerable measure will be used.
tion the experts in the lines of pro
be in close touch. They can be mut
pect the most fruitful results from

)f course, the Office of Markets has established contacts with ups of producers of particular products in a number of sections l will increasingly do so. It will advise with representative in- idual farmers and representatives of organizations dealing with cial crops over a given area, with live-stock men, dairymen, pro- cers of grain, cotton, fruit and other perishables, with men en- ged in handling products, and with transportation and other ents. In time, there may be developed in particular sections more less formal advisory bodies of men interested in the same prob- ns. This, it seems to me, will be the natural development and di- ction of development. It will come slowly and naturally. It ould not be unduly forced, and machinery manufactured and im- sed from above is not likely to make much headway.

Mr. HAUGEN. Mr. Secretary, has consideration been given to the ancing of these exchanges which you speak of?

Secretary HOUSTON. They will have to finance themselves.

Mr. HAUGEN. You mean on the cooperative plan? You think y could stand that expense at the terminals?

Secretary HOUSTON. I think it will be possible to do on a small le what has been done in a large cooperative way in certain dairy- enterprises, in elevator enterprises, and in the marketing of its. And cooperation on a big scale is possible in the marketing many crops. In the long run, the actual work of marketing will done by the individuals or the groups of individuals. Our par- ular task is to suggest the best way of doing things on the produc- n side and on the marketing side, and, at least temporarily, by monstrations to show how the requisite knowledge of market con- ions can be secured.

Mr. HAUGEN. We have been talking about exchanges. There will first the elevator in the community and then the elevator at the minal. That is one of the plans under consideration.

The CHAIRMAN. Mr. Secretary, there is one proposition which has ubled the committee a good deal on the floor in connection with consideration of this bill, and that is the question as to whether not it is wise for the department to undertake to classify the laries of your scientific force. I would like to have a brief state- nt from you in regard to the facts in connection with that propo- ion.

Secretary HOUSTON. I suppose that is a question which comes up connection with every similar institution in the Nation. It is a estion that comes up in every State university. It is a question at comes up in every department which has to deal with scientific oblems and with a highly trained personnel.

It is perfectly simple to provide by statute for the salaries of peo- e doing routine work—that is, for a clerical force, which constitutes very considerable percentage of the personnel of the department. ut where you are dealing with highly trained men, with chemists, perts in plant industry, in animal industry, or in marketing, it ems to me it would be both unwise and uneconomical to try in ad- nce to fix salaries.

Suppose, for instance, a man getting $3,500 a year (and there are w people in the department getting that salary)—a man doing ork, for instance, in pathology—resigns. How shall we fill the

HOUSTON. That was two years ago.
IRMAN. I think it was two years ago. Do you happen to and, how many of your employees are getting the maxi-?
HOUSTON. That authority was given two years ago. ore than 16,000 employees in the department and only one en promoted to that salary, except Mr. Brand, who was of the Office of Markets and Rural Organization.
IRMAN. That seems to be pretty good evidence that you g to abuse your authority in the way of promotion.
ERMOTT. Mr. Secretary, during the prevalence of the foot- disease Dr. Bennett, who was in charge in Chicago, was to spend some money. He spent $137.60, and when his o the Comptroller of the Treasury the comptroller re- ow it to be paid. That was supposed to have been paid $2,500,000 appropriation for combating the foot-and- se. Is there any provision in this bill for repaying Dr. l other men the money they spent for that purpose?
HOUSTON. No. It seems to me, Mr. McDermott, that atter which ought to go to the Claims Committee. If a nt to the Claims Committee and were referred to the de- he department would be very glad to report on it.
ERMOTT. That seems to be a very small amount to be paid 500,000 appropriation.
HOUSTON. Since the question has been raised, I will cts: Dr. Bennett's office was in Chicago, but he was com- e outbreak of foot-and-mouth disease to give his entire and day, to the work and to remain away from home. It y just to the department that his extra expense, which d under orders in a great emergency, should be paid by ent. We thought we had a right to authorize it. When he Comptroller of the Treasury, he disallowed the claim.
ERMOTT. Dr. Bennett is a very efficient veterinarian.
HOUSTON. He did exceptionally good work. The matter resented to the Committee on Claims, and if it is referred tment we will be glad to report on it.
GEN. Mr. Secretary, you referred to hog cholera. Per- ould like to tell us something as to how you expect to r plans in regard to that.
HOUSTON. I should be glad to say just a word.
IRMAN. The whole matter has been referred to a sub- but the full committee would like to have your views in

HOUSTON. In my annual report, after conferring with of the Bureau of Animal Industry, I made a suggestion um tests be more adequately safeguarded, because I con- absolutely imperative that the serum used in the hog- k should be kept potent and pure as long as possible. t can be contaminated. I made a suggestion that a Gov- t station be established. Upon further consideration, I to think that we can work out a cheaper method of arriv- same result. I still think we ought to have additional nd that, so far as is humanly possible, the serum used otent and absolutely free from contamination. I am in-

...ss, } HOUSE OF REPRESENTATIVES. { REPORT
...on. } { No. 296.

AGRICULTURE APPROPRIATION BILL.

...916.—Committed to the Committee of the Whole House on the state of the Union and ordered to be printed.

...VER, from the Committee on Agriculture, submitted the following

REPORT.

[To accompany H. R. 12717.]

...Committee on Agriculture begs to submit the following report, ...mpany the bill (H. R. 12717) making appropriations for the ...tment of Agriculture for the fiscal year ending June 30, 1917.

...total sum carried by this bill for the Department of Agricul- ...exclusive of permanent annual appropriations, is $24,501,093, ...crease of $1,529,311 over the appropriation for the current fiscal ... and a decrease of $97,996 below the estimates submitted by the ...rtment.

...n submitting this report the committee desires to call particular ...ntion to the fact that exhaustive hearings were held, extending ...r a period of nearly six weeks, at which the work of the depart- ...nt was discussed in minute detail. The officials in charge of the ...ious lines of work appeared before the committee and not only ...e the results which have been accomplished but presented their ...ns for the next fiscal year. The committee in every case endeav- ...d to ascertain the value of the work now being done and the wis- ...n of the increases suggested by the estimates. After the most ...rough consideration of every item in the bill the committee ...ieves that the recommendations herewith submitted are fully ...tified.

...t will be noted that provision has been made throughout the ... for the transfer of a number of employees from lump-fund ...s to statutory rolls. The committee and Congress from time to ...e have expressed their preference that so far as possible perma- ...nt employees of the Department of Agriculture performing ...rical or routine work should be placed on the statutory roll. The ...partment, carrying out the desire of the committee and of Con- ...ss, made provision in the estimates for the transfer to statu- ...y rolls of all employees whose status is permanent and whose

duties are of a nonscientific nature, involving 348 employe
salaries aggregating $342,100. These transfers are shown i
by the tables under each bureau which appear on subsequ
of this report.

The increase carried by this bill over the appropriation
present fiscal year is 6.6 per cent, as against an average ne
10.8 for the five preceding years.

The following table shows the appropriations for the pres
year, the estimates submitted by the various bureaus and o
the Secretary of Agriculture, the estimates submitted by the
ment of Agriculture to the committee, the amount carried
bill, the increases and decreases of the bill as compared w
estimates submitted by the department and with the appro
for the present fiscal year:

Appropriations, 1917, United States Department of Agriculture.

Bureau or office.	Appropriation in agricultural act, 1916.	Bureau or office estimates, 1917.	Department estimates, 1917.	Reported by House committee.	Increase over or decrease below department estimate.
Office of the Secretary	$322,940	$402,210	$402,260	$402,260	— $50
Office of Farm Management	271,180	347,780	350,840	350,840	— 30,940
Weather Bureau	1,960,020	1,965,650	1,796,650	1,770,700	— 27,950
Bureau of Animal Industry	2,565,520	2,991,600	2,957,740	2,992,740	+ 35,000
Bureau of Plant Industry	2,220,220	2,365,910 +280,000	2,242,770 +280,000	2,531,020	— 11,750
Forest Service	1,422,250	1,610,220	1,549,720	1,543,920	+ 200
Bureau of Chemistry	1,060,320	1,299,360 +20,000	1,147,080 +20,000	1,135,080	— 32,000
Bureau of Soils	227,920	259,235	259,235	229,720	— 30,000
Bureau of Entomology	620,260	880,780 +5,000	820,300 +5,000	805,580	+ 32,280
Bureau of Biological Survey	446,720	541,670 +125,000	491,910 +125,000	574,220	— 41,690
Division of Accounts and Disbursements	41,220	45,170	44,870	44,870	
Division of Publications	225,360	230,280	196,080	197,520	+ 1,440
Bureau of Agricultural Economics	252,640	321,344	316,440	316,440	
Library	40,220	42,840	40,320	40,320	
Miscellaneous expenses, Department of Agriculture	115,000	125,000	115,000	115,000	
Rent in the District of Columbia	122,680	122,680	122,680	122,680	
Weather Bureau service	2,221,940	3,000,000	2,961,940	2,960,540	+ 80,000
Office of Public Roads and Rural Engineering	362,425	465,225	422,305	389,700	— 32,605
Office of Markets and Rural Organization	434,520	580,191	830,201	782,330	— 47,871
Enforcement of the insecticide act		129,540	110,260	105,000	— 5,260
National Bird Reservation Board		75,000	75,000	75,000	
Total, Department of Agriculture, formative and ordinary bill	19,931,352	23,676,327	21,736,599	21,951,023	+ 46,424
Miscellaneous appropriations:					
Enforcement of the insecticide act	100,000				
Enforcement of the plant quarantine act	50,000				
Eradication of foot-and-mouth disease	50,000				
Domestic quarantine service	100,000				
Demonstrations on reclamation projects	40,000	80,000	40,000	40,000	
International Dry Farming Congress, Denver, Colo.	20,000				
Destructive fire protection in national reservations of the public domain	100,000	100,000	100,000	100,000	

[1] Supplemental estimate. + Increase; — Decrease.

Appropriations, 1917, United States Department of Agriculture—Continued.

Bureau or office.	Appropriation in agricultural act, 1916.	Bureau or office estimates, 1917.	Department estimates, 1917.	Reported by House committee.	Increase over or decrease below department estimates.	Increase over or decrease below 1916 appropriation.
Miscellaneous appropriations—Continued.						
Experiments and demonstrations in live-stock production in cane-sugar and cotton districts of the United States	$60,000	$60,000	$60,000	$60,000		
Naval stores investigations	5,000	5,000	5,000		— [1] $5,000	— [1] $5,000
Eradication of foot-and-mouth and other contagious diseases of animals	2,500,000	2,500,000	2,500,000	2,500,000		
Lands for dry farming station, Oklahoma	200					— 200
Commission on rural credits	10,000					— 10,000
Maps, charts, and reports to trace shifting of agricultural industries		15,000	15,000		— 15,000	
Experiments in dairying and live-stock production in semiarid and irrigated districts of the Western United States		87,500	87,500		— 87,500	
State cooperation in marketing work		35,000	35,000		— [2] 35,000	
Grand total, Department of Agriculture	22,971,782	25,929,027	24,599,089	24,501,093	— 97,996	+1,529,311

[1] Transferred to Bureau of Chemistry.
[2] Transferred to Office of Markets and Rural Organization.

As will be seen from this table, the amount carried in the agriculture appropriation act for 1916 is $22,971,782; in addition, sums aggregating $225,000 appropriated by special acts and $395,000 by the recent urgent deficiency bill will be expended during the present fiscal year, making a total, aside from the permanent annual and deficiency appropriations, of $23,591,782. The sum carried in the appropriation bill for 1917, as reported by the committee, is $24,501,093, an increase over the amount carried in the appropriation act for the present fiscal year of $1,529,311. Taking into consideration, however, the funds available from the appropriations made by special acts and the urgent deficiency bill, amounting to $620,000, the actual increase in the bill under consideration over the appropriations for similar objects during the fiscal year 1916 is only $909,311.

While the total carried by this bill is $24,501,093, the fact must not be lost sight of that one of the items—the appropriation of $2,500,000 for combating foot-and-mouth disease or other contagious or infectious disease of animals which may threaten the live-stock industry of the country—simply constitutes an emergency fund to be used only in case there is an outbreak of any of these diseases. If there is no outbreak the fund will not be used and will be retained in the Treasury.

REVENUES.

In considering the above table, it should be borne in mind that the appropriations of the Department of Agriculture are offset to some extent by certain revenues resulting from or incident to its

[redacted]

[illegible] [illegible] [illegible] [

The States of Arizona and New Mexico received additional shares national-forest receipts for their school funds on account of school nds included within national forests, as follows: Arizona, $28,966.46; ew Mexico, $9,311.87.

Sale of condemned and other property, $41,517.60.—This covers the le of unserviceable property owned by the department which has een passed upon, condemned, and ordered sold by a board of survey ppointed by the Secretary. It also covers the proceeds derived from ie sale of farm products grown on the various experiment farms of ie department throughout the country (other than insular stations); imals and animal products no longer needed in the work of the de- rtment; prints, lantern slides, transparencies, blue prints, forest aps, maps and publications of the Weather Bureau, card indexes of periment-station literature, pathological and zoological specimens, mples of pure sugar, naval stores, microscopical specimens, etc.

Sale of hearings, $208.15.—This covers the sale of hearings con- ucted by the department in connection with the enforcement of the od-and-drugs act, the insecticide and fungicide act, etc. These hear- gs are sold to corporations, firms, and individuals desiring them at ie rate of 10 cents per folio to cover the cost of preparing them.

Receipts from United States seacoast telegraph lines, $3,852.73.— hese receipts are derived from the transmission of messages for pri- ate individuals over Weather Bureau telegraph lines through isolated gions along the seacoasts, where commercial lines are not yet avail- ble.

Sale of official cotton standards, $7,556.50.—This covers the sale of fficial cotton standards prepared by the Department of Agriculture o the various exchanges, spot-market dealers, merchants, cotton ills, agricultural colleges, and textile schools.

Receipts from settlement of disputes, $14,821.85.—These receipts are erived through the settlement of disputes referred to the department rom time to time by either party to a contract of sale of cotton for uture delivery for determination as to the quality, grade, or length f staple of the cotton, in accordance with the provisions of the United States cotton futures act of August 18, 1914.

SCOPE OF DEPARTMENT'S ACTIVITIES.

It is impossible, of course, in a report of this kind to give a com prehensive idea of the scope of the activities of the Department of Agriculture. Generally speaking, these activities may be divided nto three classes:

(1) Research work, which includes the scientific study of the funda- nental problems of agriculture.

(2) Educational or extension work, which aims to make available o the rural population the results of the department's experiments nd discoveries.

(3) Regulatory work, which includes the administration of the fol- owing statutes: Meat inspection act, cattle quarantine act, diseased nimal transportation acts, 28-hour act, virus-serum-toxin act, ood and drugs act, insecticide and fungicide act, plant quarantine ct, seed importation act, Lacey game act, migratory-bird act, and he cotton futures act. For convenience, the administration of the national forests also is included under this heading

sfers from funds of other bureaus, which funds have been respondingly reduced—Continued.

1 clerk, from statutory roll, Bureau of Chemistry	$1,020	
1 clerk, from meat inspection, Bureau of Animal Industry	1,000	
1 clerk, from administrative expenses, Bureau of Animal Industry	900	
1 clerk, from statutory roll, Bureau of Chemistry	900	
1 clerk, from statutory roll, Forest Service	900	
1 clerk, from road building and maintenance, Office of Public Roads	900	
1 clerk, from cotton-futures act, Office of Markets	900	
1 assistant messenger or laborer, from general administration, Forest Service	720	
1 messenger or laborer, from food and drugs, Bureau of Chemistry	660	
1 elevator conductor, from statutory roll, Bureau of Plant Industry	720	
1 elevator conductor, from cotton-futures act, Office of Markets	600	
1 elevator conductor, from road material, Office of Public Roads	600	
1 elevator conductor, from farm irrigation, Office of Public Roads, with change of title from unskilled laborer, $600.	600	
1 cabinetmaker or carpenter, from statutory roll, Bureau of Animal Industry	1,100	
1 tinner's helper, from general administration, Forest Service.	720	
1 watchman, from administrative expenses, Bureau of Plant Industry	720	
1 watchman, from farm drainage, Office of Public Roads	720	
1 skilled laborer, from statutory roll, Bureau of Animal Industry	840	
1 skilled laborer, from statutory roll, Division of Publications	840	
1 skilled laborer, from statutory roll, Division of Publications	720	
1 messenger or messenger boy, from statutory roll, Forest Service	360	
		$40,910

ansfers to rolls of other bureaus, and the Secretary's roll correspondingly reduced:

1 clerk, to statutory roll, Office of Farm Management	1,000	
1 clerk, to statutory roll, Library	900	
1 mechanic, to statutory roll, Office of Public Roads	1,200	
		3,100
		$37,810
Apparent increase		50,310

ange of title:

1 officer in charge of supplies, at $2,000, in lieu of 1 chief, supply division, at $2,000.
1 clerk, class 2, in lieu of 1 construction inspector, at $1,400
1 assistant engineer, at $1,400, in lieu of 1 assistant chief engineer, at $1,400.
1 assistant messenger or laborer, at $720, in lieu of 1 unskilled laborer, at $720, from lump fund of Forest Service.
1 messenger or laborer, at $660, in lieu of 1 unskilled laborer, at $660, from lump fund of Bureau of Chemistry.
1 elevator conductor, at $720, in lieu of 1 messenger or laborer, at $720, from statutory roll of Bureau of Plant Industry.
1 elevator conductor, at $600, in lieu of 1 unskilled laborer, at $600, from lump fund of Office of Public Roads.
1 skilled laborer, at $840, in lieu of 1 laboratory helper, at $840, from statutory roll of Bureau of Animal Industry.

ansfers to statutory roll of Division of Publications from lump fund for Secretary's Office, which fund has not been correspondingly reduced: 2 laborers, at $600 each.

It will be noted that, while the apparent increase in the statutory ll of the Secretary's Office is $50,310, the actual increase is $12,500.

of tenure, type of farming, size of business, yield of crops per
oducts per head of live stock, diversity of business, seasonal
tion of labor, and farm organization in general; cost of the
living and the amount contributed by the farm to the living
rm family; systems of farm tenure, with special reference to
of lease contract best suited to different types of farming and
ent sections. It involves the study of the character, cost,
quacy of farm equipment in machinery, implements, work
etc., on farms of different types in different sections of the
. Studies are conducted on the history and distribution of
terprises with a view to discover the various factors which
ne the distribution of crops and live stock in this country.
uires a study of the history of farming to gain further insight
forces that have caused the shifting of agricultural enterprises.
n is given to the subject of farm accounts to determine
l methods of farm bookkeeping and farm cost accounting.
mportant part of the work done under this item relates to the
systems of organization found on farms of all sizes and types
ctions of the country and, by means of the information thus
l and the results of the investigations indicated, to develop
of organization that will give the best possible utilization of
ner's capital, of the labor available to him, and of his equip-
nd, so far as possible, involve only farm enterprises that
ticularly adapted to the soil and climatic conditions of his
d to the market facilities of his locality.

tem carries an apparent decrease of $10,000, but, taking into
ation transfers to statutory rolls, the actual increase is $14,390.
posed to apportion this increase in the following manner:

dministration, $3,900: This sum will provide for the salary
vel expenses of an expert in practical farming who will advise
n of the office, and pass upon the manuscripts submitted for
ion with reference to their applicability to farm conditions.

arm economics, $5,100: This sum will be used to employ
ry field assistants to aid the permanent staff in securing
al data on live-stock economics, with a view to meet the more
demands for the solution of special problems connected with
lustry.

arm organization, $5,390: Many of the men in the Office of
lanagement formerly were performing both investigational
nonstrational work. Most of these men upon the reorganiza-
the department were transferred to the States Relations
and assigned to purely demonstrational work. This left the
f Farm Management with insufficient force properly to con-
e farm-management work in some of the most important
ural districts of the United States. This increase will enable
ce of Farm Management to meet the situation in part by the
ment of temporary field assistants during the crop season.

d-off land investigations (page 4, line 24).—This item provides
study of methods used in the various timbered sections of the
States in clearing stumps from land from which the timber has
en and of putting this land in condition for farming. It also
a study of the cost and practicability of these various methods
ifferent conditions. An attempt is also made to determine
omic value of the land before and after the stumps are removed

and other miscellaneous expenses that are customary and inci-
to the operation of Government offices.

The collection and dissemination of climatological and meteoro-
information: The collection by telegraph at least twice daily
orological observations taken at the various regular and special
s outside of Washington, the preparation of charts, and the
of weather forecasts, and hurricane, storm, cold-wave, snow,
and flood warnings for a district comprising 24 States, the
Lakes, the Atlantic coast, West Indies, and the East Gulf
the assembling, checking, and the compiling of meteorological
ations from the 202 regular stations and about 5,000 special
operative stations, and the furnishing of this information to
ried interests of the country that require weather data. Dur-
crop-growing season, from April 1 to September 30 each year,
weather reports are secured from the cotton, corn, wheat,
rice, and other staple crop-growing regions and disseminated
by telegraph and in the form of bulletins for the benefit of
owers and others interested in current crop conditions.

Scientific activities: Investigation of problems in forecasting,
e, river and flood work, solar radiation, aerological research,
logy, evaporation, and agricultural meteorology, and the
ng and improving of instruments which are required in the
and recording of the various meteorological elements with
the bureau is concerned. All these lines of work, with the
ion of the instrumental work, also are conducted outside of the
f Washington and are described under the item covering the
ies of the bureau outside of the city of Washington.

salaries of all of the scientific and technical employees of the
on duty in Washington are paid from this item. These
yees are engaged in special investigations and technical work,
ost of them are in charge of divisions which have general super-
of the scientific activities conducted in the field.

re is an apparent decrease in the item of $750, due to a transfer
statutory roll of the Office of the Secretary.

ntenance of printing office in the city of Washington (page 8,
).—This office is maintained for the prompt issuance of weather
bulletins, forecast cards, forms, instructions, etc., which, on
t of the necessity for immediate distribution, can not be
d at the Government Printing Office without impairing the
e of the bureau.

re is an apparent decrease of $1,200 in this item, due to the
er to the statutory roll of one lithographer.

enses outside of Washington (page 8, line 19).—The expenses
ary for the maintenance and operation of 202 principal stations
eir coordinated and related substations, about 5,000 in number,
ing rent of offices, repair and maintenance of buildings, sup-
salaries of the scientific force, and all other expenses, except
laries of printers, messengers, laborers, and repairmen, and
ing expenses, are paid from this item. The work involves the
ination of forecasts and warnings, telegraphing and telephon-
eration of seacoast telegraph lines, vessel reporting, the gauging
rs and the issuing of forecasts of river stages and flood warnings,
ertain scientific investigations.

d number of stations located on the islands in the Caribbean
. The service will be made continuous throughout the year
ers will report twice a day. Less frequent observations
uate during storm conditions. The number of stations,
on the northern coast of South America, in the region of
Zone and in Central American countries, including the south-
ast, will be increased. In addition to land stations, a
ber of reports will be secured from vessels plying these
ich are equipped with wireless apparatus.
he extension of the frost warning and river and flood work,

st-warning work is of great value to growers of truck
acco, and fruits. If the growers have advance notice of
ch of frost, it is entirely practicable to provide protection
rops. The committee believes that the work is important
rovided this increase in order that it may be extended.
r and flood warning work involves the collection and dis-
, particularly to the parties most directly concerned, of
n relating to floods. With the increase recommended it
ssible to meet the demands for the extension of the work
here it has not hitherto been carried on.
he extension of the work of the Weather Bureau in Alaska,

mittee believes that the extension of the work in Alaska
by the growing importance of the Territory and the
velopment of its agricultural and industrial resources.
re, Alaska is what has been termed "a breeding ground"
that eventually find their way into the northern United

increasing the compensation of the field employees of the
Bureau, $7,500.
ll provide increases in salary for about 70 or 80 efficient
oyees who have been in the service of the bureau for periods
om 5 to 20 years, with very slight promotions during those

raveling expenses (page 9, line 1).—This item covers the
expenses of the Weather Bureau for all purposes. There
ge in the amount.
of building at Cape Henry, Va. (page 9, line 2).—The
ilding at Cape Henry is located on land which recently has
sferred to the War Department to be used as a site for
ns. This building has been in use over 50 years, is in a
d condition, and can not be moved. A new building,
will be necessary for the service of the Weather Bureau.
orting is an important feature of the work at the Cape
tion, and a building will be required which will give an
ted outlook for marine traffic. It is believed that the
f an adequate building and the securing of the necessary
quire at least the amount recommended by the committee.
of building in Panama Canal Zone (page 9, line 8).—Pro-
been made in the item relating to expenses outside of the
ashington for the extension of the weather service in the
Sea region and to the Panama Canal Zone. This will
the erection of a suitable building in the zone as a central

itle—Continued.
itive clerk, at $2,000, in lieu of 1 assistant chief of miscellaneous division, $2,000, from lump fund.
atory helper, at $1,020, in lieu of 1 laboratory aid, at $1,020, from lump id.
enger, skilled laborer, or laborer, at $720, in lieu of 1 skilled laborer, at 20, from lump fund.

GENERAL EXPENSES.

ion and quarantine (page 12, line 18).—This item includes of eradicating sheep and cattle scabies in the territory west ssissippi River, in cooperation with the States; the eradica- glanders, scabies of horses and anthrax; the inspection of cattle permitted under certain restrictions to move north diate slaughter from the Texas-fever areas of the South; rculin and mallein testing of animals shipped interstate, general supervision of all animals so shipped; the inspection carrying live-stock shipments from this country: the guard- e Mexican and Canadian borders to see that only healthy cross the line; the maintenance of stations at the ports of New York, and Baltimore for the inspection and quarantine ted animals; the tuberculin testing of pure-bred cattle with of establishing a registry of pure-bred herds used for breeding which are free from tuberculosis; the gathering of informa- he prosecution of cases under the 28-hour law; and the test- ttle for export to foreign countries.
is a decrease of $75,000 in this appropriation.
radication (page 13, line 3).—The eradication of the cattle a direct bearing upon the meat supply of the country, and ntly is a matter of national concern. The South is naturally to cattle raising, but it can never become an important beef supply until Texas fever is eradicated and the quaran- nst the free movement of cattle is removed.
adication work has been conducted by the department since d is now progressing more satisfactorily than ever before. s on the part of cattle owners and lack of proper State laws finite cooperation at various times have hindered the work, obstacles are now practically overcome. Since the work n an area containing more than 4,000,000 cattle has been from quarantine. The total area still under quarantine is quare miles, 274,782 square miles having been freed of ticks sed. During the past year 49,629 square miles were freed sed.
ork is done in cooperation with the States, which are mani- n increasing interest in tick eradication and a new appre- f their possibilities for cattle production.
em carries an apparent increase of $193,600, but, as $900 transferred to the statutory roll, there is an actual increase 00. The eradication of the cattle tick is a practical proposi- ne tick can be eliminated. The Secretary of Agriculture, in nent before the committee, said:

tion is whether we shall get rid of it relatively quickly or whether we shall k drag. It is not a question of an indefinite continuance of appropriation s annual increases, but of larger appropriations over a few years instead of e for a long period. We can get rid of this nuisance with a less aggregate

rneal on the health of hogs; and the farm methods of curing
Pig clubs, with 10,000 members, have been organized in 13
s, in cooperation with the States Relations Service and the
ultural colleges.
e production of beef in the Appalachian region is being
ied by means of experiments in cooperation with the West Vir-
and the North Carolina Experiment Stations. Beef production
is being studied at two points in Mississippi in cooperation with
Mississippi Experiment Station. In cooperation with the Kansas
ion a study has been begun of the inheritance of beef and milk
duction qualities in Shorthorn cattle.
horse and mule investigations, a study is made of the cost of
ing horses. In cooperation with the Colorado Station efforts are
le to develop a breed of horses suitable for carriage and general
purposes. At the Morgan-horse farm in Vermont Morgan
es are bred. Experiments are in progress in cooperation with
Iowa Station in breeding gray draft horses. In cooperation with
War Department, work is under way to encourage the breeding of
es for military purposes in the States of Vermont, New Hamp-
, Virginia, West Virginia, Kentucky, and Tennessee. In coop-
on with the Interior and War Departments, demonstrations in
breeding have been undertaken at the Cheyenne River Agency,
outh Dakota.
poultry investigations studies are made in the feeding and
ling of poultry to determine the efficiency of various rations,
problems underlying the subject of breeding poultry and the
ing of poultry are investigated. Studies of the incubation of
of the economy of turkey raising, and of the problems under-
the ostrich industry in the United States are under way. Poul-
lubs, with 5,000 members, have been organized in seven States.
sheep and goat investigations, a study is made of the pro-
ion of sheep under range conditions and of the adaptability of
Corriedale sheep of New Zealand to American conditions. Sheep
ng in New England is being studied at the Morgan-horse farm, in
ont. An exhaustive study of the possibility of developing an
rican breed of milch goats is under way. The production of wool
been studied, particularly with the idea of showing farmers and
men how they may improve the quality of their output through
r methods of preparation. A car has been equipped with a com-
collection of the market breeds and classes of wool samples and
bits showing the process of manufacturing wool into clothing
the detrimental results of improper methods of preparation, etc.
ere is an increase in this item of $19,260. This amount will be
nded as follows:

Pork production investigations, $4,260.
Shorthorn cattle investigations, $5,000.
Poultry breeding investigations, $2,500.
Breeding range sheep, $5,000.
Classification of wools, $2,500.

seases of animals (page 14, line 14).—Under this item are con-
ed numerous investigations with the view of determining the
e, methods of spread, means of treatment, and protective meas-
against animal diseases. Some of the more important diseases

Enforcement of the virus-serum-toxin act of Mar. 4, 1913		$175,000
Eradication or control of hog cholera in selected counties	$160,000	
Systematic demonstrational and educational hog-cholera work	35,000	
		195,000
Pure research work		35,000
Total		405,000

The development of the inspection of establishments licensed under the virus-serum-toxin act has gone forward rapidly, and it is clear that additional inspectors are needed for the enforcement of the act and for preventing the sale of worthless, contaminated, dangerous, or harmful products of the kind covered by the act. The department estimates that $175,000 will be required to effectively prosecute this work during the next fiscal year. It will be used to develop and improve inspection of plants preparing anti-hog-cholera serum and hog-cholera virus. One or more inspectors will be detailed to supervise the operation of each licensed establishment.

It is proposed to continue the county hog-cholera eradication or control work and the systematic demonstrational and educational work which has been conducted principally under the provisions of the act of February 23, 1914. A small increase has been allowed so that greater emphasis may be placed on the systematic demonstrational and educational work, with the view of educating farmers as to the methods of controlling or eradicating the disease. Provision also has been made for the continuation and enlargement of the pure research work concerning the causes, modes of spread, and methods of treatment and prevention of hog cholera.

Dourine (page 15, line 14).—In the appropriation act for the present fiscal year the dourine work is provided for in the item which carries the appropriation for hog cholera. The committee, however, thought it wise to separate the two lines of work. Accordingly a separate paragraph carrying an appropriation of $75,000 for dourine, the amount provided in the appropriation act for the present fiscal year, has been inserted in the bill under consideration.

Administrative expenses (page 15, line 16).—There is an apparent decrease in this item of $9,100, but, as this amount has been transferred to other rolls, there is no actual change.

MEAT INSPECTION (page 15, line 22).

The meat-inspection act of June 30, 1906 (34 Stat. L., p. 674), carries a permanent annual appropriation of $3,000,000 for its enforcement. The amount carried in this item is an additional appropriation for the same purpose. The entire amount is used in the ante-mortem inspection of animals, the post-mortem inspection of carcasses, the supervision of the disposal of condemned carcasses and parts, and the supervision of the preparation of meat food products and of the shipment of such products. The work is located in 233 cities and towns throughout the United States, chiefly at the stock-slaughtering centers. Approximately 2,800 persons, chiefly veterinarians and inspectors of meats, are employed in the meat-inspection service.

There is an apparent decrease in the item carried in this bill of $30,500, but, as that amount has been transferred to statutory rolls, there is no actual change.

lorida sapodilla, pomegranate, horse-radish, vanilla, camphor,
rious other host plants. The office maintains a collection
ological and pathological specimens for use in the study and
cation of the diseases mentioned. The work also embraces
ntification and classification of the fungi causing various
iseases, studies of the poisonous and edible mushrooms, and a
f the life histories of fungi for the purpose of effectively
ing new and serious fungous pests.
is an increase in this item of $4,000 to provide for the exten-
the investigations of diseases of tobacco, particularly the
le wilt.
-disease investigations (page 18, line 20).—This item provides
arch work on diseases of fruit-bearing plants with the view
olling or eradicating them, and studies of the resistance of the
o such diseases through breeding and the selection of disease-
t stocks. A study is made of fungous and other diseases of
us fruits, citrus and subtropical fruits, including the pineapple,
iseases, small fruit diseases and the diseases of the cultivated
the orchards, in storage, in transit, and on the market with
to their eradication or control. Methods of combating
iseases also are studied and spraying demonstrations and
ients looking to their control are conducted. In cooperation
e Bureau of Entomology, an effort is made to devise com-
praying schedules for the control of both insect and fungous
. Diseases resulting from bad soils, nutrition troubles, frost
, and other environmental conditions and disturbances within
nts themselves also are studied.
ll be noted the word "investigation" has been substituted
word "control." The work conducted under this item is
investigational in character.
e is an increase in this item of $7,500, $2,500 for enlarging
k upon general orchard diseases and $5,000 for investigations
s and subtropical fruit diseases.
s canker (page 18, line 22).—Citrus canker is a highly infectious
l disease of citrus trees. It is widely prevalent in the Gulf
is causing great losses, and is a constant menace to those
which have not already become affected. It has been esti-
that the value of the citrus industry in the States affected
atened is approximately $200,000,000. An appropriation of
was made at the last session of Congress for cooperative work
e Gulf States in controlling the epidemic. This sum was
lly expended before the close of the fiscal year 1915, and the
ates expended a similar amount in the work. Florida appro-
$195,000 for fighting the disease, but this sum, as well as
ontributed by growers and other interested parties, was ex-
hausted by January 1, 1916. The disease was spreading so
and the situation became so urgent that the Secretary of
ture, on January 14, 1916, transmitted to the Congress an
e of $300,000, which has been included in the urgent de-
bill, to provide for the work during the remainder of the
fiscal year. In December, 1915, hearings on the subject
eld at which representatives of the growers and interested
rs of Congress appeared and presented the situation to the
tee. Later a representative of the department who had

... of the infected areas also appeared before the committee ... of the boards of his observators. The Secretary of Agr... on February 28, 1916, transmitted to the committee a le... recommending that an appropriation of $250,000 be included in ... bill in order that the eradication work might be prosecuted thro... the next fiscal year. The committee is impressed with ... importance of and the necessity for continuing the work ... recommends that the amount estimated by the department be allo... Because of the exceedingly infectious nature of the disease and of ... large areas involved, it seems to the committee that the proble... one in which the Federal Government should cooperate with the S...

... page 19, line 10.—Under this item are inc... studies of diseases of ornamental and shade trees and shrubs, dis... of forest trees, pathological problems of wood preservation, and ... research, special investigations of newly imported diseases tha... are now or likely to become so. These investigations are for ... purpose of developing adequate methods of control or eradicati... There is an increase in this item of $30,000. On January 26, ... Secretary of Agriculture transmitted to the Congress an est... of $2... which has been included in the urgent deficiency bi... authorize the department to cooperate with the States and lo... interested in the eradication or control of the white pine blister r... destructive disease of pine trees. The history, development, an... importance of the disease, and the importance of immediately inspe... those areas where it is supposed to exist, are fully set out in the ... letary's communication, which has been printed as Senate Docu... No. 370. While the disease exists at the present time principa... the New England States, its eradication or control is of great im... to the many States in the East, West, and South. The Fe... Government is concerned with the problem because of the many ... States involved and on account of the large volume of pine tim... the national forests which would be menaced by the spread of th... ease. The sum of $2,000 included in the urgent deficiency bi... provides for the work only during the remainder of the present ... year. It is essential, if effective results are to be secured, that ... work be continued beyond June 30, 1916. The Secretary of Agr... ture accordingly, on February 8, 1916, transmitted to the Con... a supplemental estimate of $30,000 for inclusion in this bill. ... points out that unless this sum is made available much of the ... of any work that may be undertaken during the present fiscal ... will be lost. The committee recommends that the increase of $3... suggested in the supplemental estimate be allowed.

... page 19, line 17.—The work under ... item comprises studies of the diseases of cotton and the bre... of wilt-resistant varieties; truck crop diseases, including potato ... roll, wilt, curly dwarf, late blight, powdery scab, Rhizoctonia, ma... and other diseases of the potato; sweet-potato diseases; cucu... diseases; the breeding of improved, rust-resistant strains of aspar... breeding of disease-resistant varieties of tomatoes and cab... forage crop diseases, including diseases of alfalfa, cowpeas, cl... etc.; and studies of the diseases of drug and related plants.

ill be noted that the word "investigation" has been sub-
l for the word "control." The work conducted under this item
ely investigational in character.
e is an increase of $3,000 in this item for the purpose of ex-
; the cotton-disease investigations.
physiology (page 19, line 19).—The investigations under this
ver the cooperative testing of crops suitable for culture by
lians on reservations in the southwestern United States; the
hment of date culture on a commercial scale and the working
the best methods of culture, propagation, etc., for use under
an conditions; the breeding and testing of citrus fruits with
to originate hardier and more disease-resistant sorts which
ain the desirable qualities of our best standard varieties; the
ction and extension of Smyrna fig culture and the breeding
eties especially suited to this country; the finding of deep-
and drought-resistant tree crops for dry-land regions and the
out of wild varieties of our cultivated fruit and nut crops
view to their utilization as stocks in dry-land regions or for
g purposes; the introduction of the pistache nut into com-
culture; a study of the effects of sprays in stimulating plant
and production; and the introduction of truffle culture and
ement of pineapple varieties.
item carries an increase of $5,000 for the breeding of disease-
t citrus varieties, the necessity for which has been emphasized
prevalence of citrus canker.
acteriology (page 19, line 21).—Under this item legume bacteria
tributed to demonstrate the benefit of the inoculation of
. Carefully supervised field experiments are conducted, pure
are distributed to farmers for field tests, and an investigation
in soil bacteriology, including the kinds, number, and func-
f micro-organisms in agricultural soils. The work includes
vestigations in date nutrition to determine the best condi-
or nutrition and fruit production and to develop a rational
of employing fertilizers in the different date-growing regions;
utrition investigations, including a study of the growth, devel-
, and composition of plants as affected by the principal fac-
nutrition; and the inspection of commercial cultures sold for
culation of legumes to determine whether they are impure,
ole, or misbranded.
e is no change in this item.
Fertility investigations (page 20, line 3).—The work done under
m consists of investigations into the causes of infertility and
s of improving the soil; the action of fertilizers upon the soil;
intenance of soil productivity; the transformation and forma-
soil humus and the study of its purpose, composition, and rela-
crop growth by means of laboratory, greenhouse, and field

e is an increase of $2,500 in this item. This su. will be used
purpose of carrying on soil studies in connection with the
y scab of the potato in Maine, New York, and other localities.
acclimatization and cotton breeding (page 20, line 7).—The
nder this item is devoted to investigating the effect of various
ons of climate and soil upon special crops. New varieties and
f crop plants are being developed with characters that render

mited extent for some time, but new language has been included to ive specific authority for the work.

2. One thousand dollars for the enlargement of the fiber-plant nvestigations, particularly with reference to sisal, flax, and hemp.

Grain handling and standardization (page 20, line 17).—Investiga- ions are made concerning the factors which must be taken into con- ideration in the handling and storing of grain on the farm and in ountry and terminal elevators and also the factors affecting the eeping qualities of grain on the farm, in the elevator, and during ransportation so as to avoid losses through deterioration. Clearly efined standards for grain that may be uniformly applied are neces- ary if the farmer is to have proper encouragement for the production f grain of better quality. The practice of buying grain merely as grain" is conducive to poor farming. Studies are made with a iew to secure reliable data to serve as a basis for the establishment f a system whereby commercial grades for grain will be in keeping ith its intrinsic value, and the results of these investigations will e used in fixing such standards.

There is an increase in this item of $15,850, which will be used as ollows:

1. Eight thousand three hundred and fifty dollars for the establish- ent of a new grain-standardization laboratory in Minnesota.

2. Seven thousand five hundred dollars for investigations relating o the handling, grading, and transportation of kafir, milo, and other rain sorghums. The words "including the grain sorghums" have een added to this paragraph so as specifically to authorize investi- ations of these products.

Biophysical investigations (page 20, line 20).—The work carried on nder this item is mainly cooperative with other offices of the Bureau f Plant Industry, and includes (1) the determination of the most fficient cultural methods for the conservation of soil moisture in egions of limited rainfall; (2) the measurement of the water require- ent of different varieties of crop plants as a basis for selecting arieties best adapted to semiarid regions; and (3) the study of ultural methods best adapted to crops grown under irrigation, specially citrus and deciduous fruit trees.

There is an increase in this item of $7,500 to extend the experi- ents relating to the water requirements of crops to the irrigated istricts and particularly to the Government reclamation projects.

Seed testing (page 20, line 22).—Under this item is included the work f seed testing, comprising tests for mechanical purity of samples of eeds submitted by firms or individuals; the examination of samples f seeds for the presence of adulterants or dodder, and the identifica- ion of weed seeds; investigations of improved methods of testing eeds for vitality under laboratory conditions, and the best methods f harvesting and storing seeds; a study of the quality of commercial eeds, and the nature of the impurities occurring in the different kinds; he examination of samples of seeds offered in the open market, ncluding seeds of grasses, clover, or alfalfa, and lawn grass; to deter- nine the extent of adulteration and misbranding; and the enforce- ent of the seed-importation act of August 24, 1912.

There is no change in this item.

Cereal investigations (page 21, line 3).—This item covers the work in the improvement and production of cereals and cereal

bject of working out accurate methods of determining the compar- resistance of crop plants to alkali and drought and of applying methods in obtaining more resistant varieties suitable for irri- d and dry-land agriculture; investigations of the feasibility of using native vegetation of arid regions in classifying land with respect to uitability for dry-land and irrigated agriculture; investigations gyptian cotton with a view to obtain varieties adapted to the ated lands of the Southwestern States and to determine the ture requirements and alkali resistance of this crop.

here is no change in this item.

ugar-beet investigations (page 21, line 22).—This work is conducted er three heads, embracing all the factors that enter into the pro- tion of sugar beets and including the relation of the crop to all er agricultural operations in a community and on the individual m. It may be subdivided as follows:

. A general survey or study of the sugar-beet industry in relation the community as a whole. The survey includes new localities well as sections where sugar beets are now grown.

. A farm-to-farm survey or study which embraces all problems ting to the individual farms on which sugar beets are grown. It udes such questions as size of farm, equipment, cultural methods their improvement, diseases and their control, and the utiliza- of beet tops and other by-products. In short, its purpose is to rmine the conditions that will yield the greatest net return to farmer for money and labor invested.

Beet-seed production, including the development and establish- t, on a permanent basis, of an American beet-seed industry that meet the present and future needs of the country. It also includes improvement of the sugar beet in quality and yield as well as of methods and practices connected with beet-seed production.

nvestigations in connection with the production of table sirup are conducted under this item, in cooperation with the Bureau hemistry. These embrace all problems relating to the table-sirup istry on the individual farm and include a study of cane varieties their development, cultural methods, and the use of such fertil- s as will give best results in quality and yield of sirup, disease con- in both growing and stored cane, and all other factors that enter the yield, quality, and keeping ability of cane sirup made on the n. The work also includes the development of improved methods anufacturing cane sirup on the farm with a view to the production he highest yield and quality of sirup of a uniform grade and the t economic utilization of the by-products.

here is no change in this item.

nvestigations in economic and systematic botany (page 22, line 7).— ler this item are carried on experiments and studies of range nts to ascertain the best methods of handling the overgrazed lic lands in order to restore them to their full range-grazing acity and to maintain them in a condition of the highest contin- productiveness. The work also involves studies of the exact tion of overgrazing to soil erosion and to forest reproduction, has for its object the bringing together of all available and useful wledge as to the utilization of plants by native American races making available such data for experimentation by agricultur- and for direct utilization by those engaged in the exploitation of

l fruits and the determination and recording of their proper
s. These studies include a consideration of native plants and of
introduced from foreign countries.
re is no change in this item.
dens and grounds (page 23, line 6).—Under this item there is
ained on the department grounds a range of greenhouses for
llowing lines of work: General hybridization work; seed testing;
imental work with collections of citrus and other tropical fruits;
opagation of plants for ornamenting the grounds of the depart-
and those of the Weather Bureau; miscellaneous experimental
experimental work with vegetables and florists' crops, includ-
oses, carnations, and chrysanthemums; and plant-breeding
The departmental grounds also are maintained under this

v language has been added so as definitely to provide that all
ses connected with the maintenance of the department grounds
shington shall be paid from this fund, and to insure authority
department to erect greenhouses on the grounds when the
ity therefor arises from time to time in connection with its
igational work.
ticultural investigations (page 23, line 14).—This item covers
n truck crops and deals with problems pertaining to the produc-
acking, and shipping of truck crops and horticultural field crops,
ing Irish potatoes, sweet potatoes, melons, beans, celery, onions,
h, and other important vegetables produced in the truck-grow-
gions, the standardization and improvement of varieties by selec-
breeding, and cultural means, and the determination of their
ability to different regions of the country; landscape-gardening
including a study of the adaptation to and longevity of various
s of trees for ornamentation of streets, parks, and other grounds,
aintenance at the Arlington farm of a collection of hardy trees,
, and shrubs so arranged as to demonstrate their decorative or
mic value and, so far as practicable, the furnishing of plans for
dornment of the grounds of institutions offering instruction in
lture, and other public institutions. The work with Irish pota-
onsists of cultural experiments and variety tests.
re is no change in this item.
ington farm (page 23, line 18).—This item provides for the equip-
and maintenance of an experimental farm as a field laboratory
ington and to provide the necessary facilities for the field use of
vestigators of the department.
re is no change in the amount carried by this item. New lan-
has been added providing that the limitation as to the cost of
buildings shall not apply to this appropriation. The department
ot contemplate at the present time the erection of any buildings
ost of which will exceed the limitation. Some of the buildings
for field laboratory investigations at Arlington farm, however,
not be replaced for $1,500, the maximum amount which may be
ded by the Bureau of Plant Industry for the construction of any
building. In the event of a fire or other serious accident to the
ings at Arlington farm, if the department did not have authority
diately to replace them, the investigational work under way
l be seriously hampered, even though funds were available which
be used for their reconstruction.

Foreign seed and plant introduction (page 24, line [illegible]), item are conducted foreign explorations of the plant the world from the standpoint of the needs of Am[illegible] with a view to secure and introduce into the United S[illegible] possessions seeds and plants upon which there is [illegible] together with such comprehensive notes, photographs, [illegible] illustrated reports as will enable the scientists of the [illegible] the State experiment stations, and farmers to exp[illegible] profitably with the introductions and to make a success of [illegible]

The work also includes the maintenance of plant intr[illegible] tations in sections of the country best suited to the [illegible] economical propagation of the plant material imported [illegible] development, in the shortest time possible, to place [illegible] material at the disposal of experimenters.

There is no change in this item.

Investigations in the collection and distribution of new and rare seeds (page 24, line 7[illegible]). The work under this includes the purchase, propagation, testing, and distribution new and rare seeds as may be found valuable for agricultural purposes. It also includes investigations for the purpose of varieties of seeds of special merit for particular uses [illegible] localities, either through selection and breeding or by means [illegible] chase, the testing of the value of improved strains or [illegible] particular purposes in special crop areas; the propagation [illegible] valuable seeds which have special merit; and the distribution [illegible] rare seeds in quantities sufficient to enable [illegible] tests to determine through practical field plantings [illegible] value for special purposes and their usefulness.

The forage crop work includes alfalfa investigations [illegible] improvement of the varieties of the cultivated [illegible] the breeding of hardy varieties for the Northern [illegible] resistant varieties for the arid regions, and [illegible] increase the production of American-grown seed [illegible] of red clover, particularly with a view to discovering [illegible] increasing difficulty in growing this crop, the [illegible] overcoming the difficulty, and the solution of important [illegible] connection with clover seed, the present American [illegible] inadequate for the needs of the farmers; investigations [illegible] designed to secure increased returns from such lands; the [illegible] and breeding of sweet clovers and other forage crops especially [illegible] Great Plains regions of the West, continued study of soy beans, [illegible] with a view to establish on a permanent basis the American [illegible] culture of soy bean oil and soy-bean meal; breeding new varieties [illegible] varieties with a special view to secure varieties which will give [illegible] seed production per acre; testing and breeding new varieties [illegible] velvet bean, one of the most valuable legumes for Florida and [illegible] Southern States; investigations of vetches, particularly with [illegible] to increased seed production; a study of the economic [illegible] cacti to determine the value of this crop for dry farming [illegible] the weeds and weed problems throughout the United States [illegible] view to determine the best methods of controlling the most [illegible] weeds, and studies of tillage and rotations so far as they [illegible] control of weeds in farm practice.

he phraseology of the paragraph has been changed so as to permit department to distribute new and rare seeds of promise to all ions of the country.

proviso has been added setting aside $5,000 for the purpose of ing a survey of the noxious-weed situation in the spring-wheat as of the United States.

he item carries an increase of $21,000. Five thousand dollars of this ount, as indicated by the proviso, will be used in making a survey of noxious-weed situation in the spring-wheat areas of the United tes. The remainder is to be used for the extension and development he forage-crop investigations and for the more effective distribution ew and rare varieties of seeds. While the proviso authorizes the use $60,000 for the purchase and distribution of seeds, it was necessary ring the present fiscal year to use only $46,530 of this amount, ing to the unusually favorable conditions under which the seeds re purchased. It is expected, however, that the entire amount of 0,000 will be required to purchase a like quantity of seeds during e next fiscal year.

Administrative expenses (page 24, line 18).—The work under this em includes the general supervision of all lines of work conducted by e various offices of the Bureau of Plant Industry.

There is an apparent decrease in this item of $1,470, due to the trans- r of that amount to the statutory roll of the office of the Secretary.

Purchase and distribution of valuable seeds (page 25, line 1).—Under his item is conducted the congressional distribution of vegetable, lower, lawn-grass, and tobacco seeds, tulip and narcissus bulbs, straw- erry plants, and shrubs; seed cleaning, and the propagation of Dutch ulbs for the distribution.

There is no change in this item.

FOREST SERVICE.

STATUTORY SALARIES (page 27, line 17).

There is an apparent increase in the statutory roll of $25,740, but n actual increase of $580, as indicated by the following table:

romotions:		
1 forest supervisor, from $2,600 to $2,800	$200	
1 map colorist, $720, to 1 draftsman or map colorist, $900	180	
1 artist, from $1,400 to $1,600	200	
Actual increase		$580
ransfers from lump funds of this service, which funds have been correspondingly reduced:		
1 clerk, from general administration	1,600	
1 clerk, from silvical investigations	1,300	
1 clerk, from general administration	1,200	
1 clerk, from silvical investigations	1,200	
1 clerk, from silvical investigations	1,100	
1 clerk, or proof reader, from miscellaneous forest investigations	1,400	
1 clerk, or translator, from silvical investigations	1,400	
1 clerk or compositor, from maintenance and supplies	1,600	
1 draftsman or surveyor, from miscellaneous forest investigations	1,500	
2 draftsmen or surveyors, at $1,400 each, from general administration	2,800	
2 draftsmen, at $1,200 each, from general administration	2,400	
1 draftsman, from miscellaneous forest investigations	1,000	
1 draftsman or artist, from miscellaneous forest investigations	1,200	

Transfers from lump funds of this service, which funds have been correspondingly reduced—Continued.

1 draftsmen or negative cutter, from miscellaneous forest investigations $1,200
1 blue printer, from miscellaneous forest investigations 720
1 carpenter, from forest products 1,200
1 laboratory aid and engineer, from forest products 1,000
2 laboratory aids and engineers, at $900 each, from forest products 1,800
1 laboratory aid and engineer, from forest products 800

Transfers to statutory roll of Secretary's Office and statutory roll of this service correspondingly reduced:

1 clerk 900
1 messenger or messenger boy 600

Apparent increase .....

Change of title:

650 forest rangers, at $1,100 each, in lieu of 650 assistant forest rangers, at $ each.
4 draftsmen or map colorists, at $900 each, in lieu of 4 draftsmen, at $ ea
3 draftsmen or map colorists, at $900 each, in lieu of 3 map colorists, at $900
1 draftsman or map colorist, at $900, in lieu of 1 map colorist, at $720.
1 clerk or proofreader, at $1,400, in lieu of 1 proofreader, at $1,400, from lump
1 clerk or translator, at $1,400, in lieu of 1 translator, at $1,400, from lump
1 clerk or compositor, at $1,600, in lieu of 1 compositor, at $1,600, from lump
1 draftsman or surveyor, at $1,500, in lieu of 1 draftsman, at $1,500, from fund.
2 draftsmen or surveyors, at $1,400 each, in lieu of 2 topographic draftsme $1,400 each, from lump fund.
1 draftsman, at $1,200, in lieu of 1 topographic draftsman, at $1,200, from fund.
1 draftsman or artist, at $1,200, in lieu of 1 artist, at $1,200, from lump fun
1 draftsman or negative cutter, at $1,200, in lieu of 1 negative cutter, at $1 from lump fund.
1 laboratory aid and engineer, at $1,000, in lieu of 1 laboratory assistant, at $1 from lump fund.
1 laboratory aid and engineer, at $800, in lieu of 1 laboratory assistant, at from lump fund.

GENERAL EXPENSES.

National forests.—The lines of work covered by the items begin on page 31, line 13, and ending on page 39, line 10, are necessary the protection, development, and use of the timber, water, forage, other resources of the several forests. While the activities on individual forests differ both in number and extent, according to character, amount, and value of the resources concerned and demand for them, the following description indicates in general work provided for:

Through national forest administration the timber is prote against fire and trespass and is made available to the public thr sales and under free use. Reforestation and maximum timber duction are provided for through the application of forestry. ful appraisals of timber are made preliminary to sales, and metho scaling, tally, or measure takes place after the timber is cut. To form this work, foresters, timber estimators, scalers, expert lum men, and other specialists are employed on the various forests, sup mentary to the regular force of forest supervisors and rangers, acc

the needs created by the current work, while a protective force
ort-term men is recruited each year for the fire season.
ater supplies are conserved through regulated use of the range,
well as through the protection and improvement of the forest
rth. Forage resources are protected, improved, and utilized
ugh a system of range administration which aims to secure the
t complete and advantageous use of each forage crop, while pro-
ing for sustained production and range improvement.
Development of agricultural, mineral, recreational, and other
ources is provided for through land classification, cooperation with
Department of the Interior in the execution of the public land laws
licable to national forest lands, regulated occupancy and use of
ds necessary in connection with any form of development, and
llar activities.
oads, trails, bridges, telephone lines, fire lines, drift fences,
ger cabins, and other structures needed for communication and ad-
nistration are provided, with a view to both the increased use and
tection of the resources and the general development of the coun-

o ascertain the best methods of using and conserving the forest
urces, special studies and investigations of various kinds are
le as required.
he funds appropriated for the individual forests provide for the
ries of technical and temporary men not on the statutory roll
for field and station expenses necessary in connection with the
vities indicated.
aken as a whole, there is an apparent decrease of $10,640 in the
s discussed, due to transfers to statutory rolls.
lassification of lands for homesteads (page 39, line 11).—This item
rides for the complete and systematic classification of all the lands
in the national forests, in order that all land which has any
ible value for agriculture may be segregated and made available
homestead entry. By the use of the funds thus provided all
cultural lands within the national forests will be classified and
egated within a comparatively short period, and their settlement
development thus will be greatly hastened. Without this con-
ensive classification, the determination of agricultural lands
ld have to be restricted to the piecemeal examination of indi-
ual tracts as they are applied for by prospective homesteaders.
sification work is now in progress in 12 Western States and in
ska, and on practically all the national forests which have not
ady been covered. By the end of the fiscal year 1916, approxi-
ely 70,000,000 acres will have been classified and the agricultural
ions made available for homestead settlement and entry, includ-
those areas most urgently desired for settlement. Eliminations
ady have been made in 51 national forests, from which a total
e area of over 11,000,000 acres have been excluded as the result of
classification work, the lands thus excluded being shown to be
er agricultural lands or lands not chiefly valuable for national-
st purposes.
he rapid classification and segregation of lands which may be
nd chiefly valuable for agriculture is of primary importance for
reasons, namely, (1) to encourage more rapid settlement and

lers for the shipment of supplies in small quantities to a widely red field force. It has also made it possible to standardize es and to develop many articles of equipment used throughout orest Service. The centralization of purchasing and distributing sulted in distinctly greater economy, efficiency, and a higher ard of equipment than would have been possible under a system cal purchasing.

There is an apparent decrease in this item of $1,600, due to the nsfer of that amount to the statutory roll.

Forest products (page 40, line 13).—This item provides for the estigation of methods for wood distillation, wood preservation, ber testing, and the testing of woods for paper making. It ludes also studies looking to the best utilization of national-forest ber and the prevention of waste in the wood-using industry gen- lly. Results obtained through these investigations and experi- nts have brought about a wide extension of the usefulness of ny timber species hitherto regarded as of little commercial value d in many ways have contributed to the more economical utilization the timber resources of the country.

There is an apparent decrease in this item of $4,800, due to the nsfer of that amount to the statutory roll.

National-forest range investigations (page 40, line 21).—This item rovides for the carrying on of investigations and experiments to ncrease the productiveness of 138,000,000 acres of national-forest and which contributes to the maintenance of over 20,000,000 head f domestic animals yielding products of an estimated annual alue of more than $25,000,000. Methods are determined for the prevention of waste, overgrazing, damaged tree growth, interference with proper methods of forest management, and erosion of water- sheds; for the securing of increased yield of forage, the revegetation of ranges denuded by overgrazing, the replacement of worthless and noxious weeds by forage plants of economic value, the use of forage resources now unutilized, the proper handling of live stock while upon national-forest lands, and the reduction of losses from poisonous plants and predatory animals.

There is no change in this item.

Reforestation of denuded lands (page 41, line 1).—This item provides for the reforestation of denuded lands within national forests which are of value chiefly for the production of timber and the protection of watersheds. Approximately 5,000,000 acres of such lands must be restocked artificially, which thus can be made to add half a billion feet of timber to the annual yield from the forests and at the same time greatly improve the stability and regularity of the stream flow on many watersheds. The benefit to the water flow is emphasized by the fact that 1,175 watersheds within national forests contribute to municipal supply and that over 1,600 water-power and irrigation developments exist within the forests, aside from many others outside which are fed by streams rising within forest boundaries. The reforestation work is progressing at the rate of 15,000 to 18,000 acres annually.

There is no change in this item.

Silvicultural and dendrological investigations (page 41, line 5).—This item provides for (1) securing information regarding the identi-

breaks, besides field quarters to the number of nearly 2,000 and uantity of range improvements constructed to facilitate the ad- istration of the grazing business. In the construction of improve- its first consideration is given to the completion as rapidly as sible of a complete system of communication by telephones and ls connecting all of the outlying field stations in order to secure ctive protection of the forests from fire.

While the prime object of the construction of permanent improve- nts upon the national forests has been to facilitate administration d make possible the greatest protection at the lowest operating st, a very great proportion of the improvement work has resulted direct and immediate public benefit, since it has rendered accessi- e and usable a vast acreage of country that otherwise would not ve been opened up for many years.

There is no change in this item.

Weeks law administrative expenses in Washington (page 42, line).—This item authorizes the use of $15,000 of the moneys appro- iated by the Weeks forestry law for the payment of salaries of nployees in the city of Washington engaged in the administration of e law, and for the purchase of supplies used in connection with the ork in Washington. A similar provision is included in the appro- iation act for the present fiscal year.

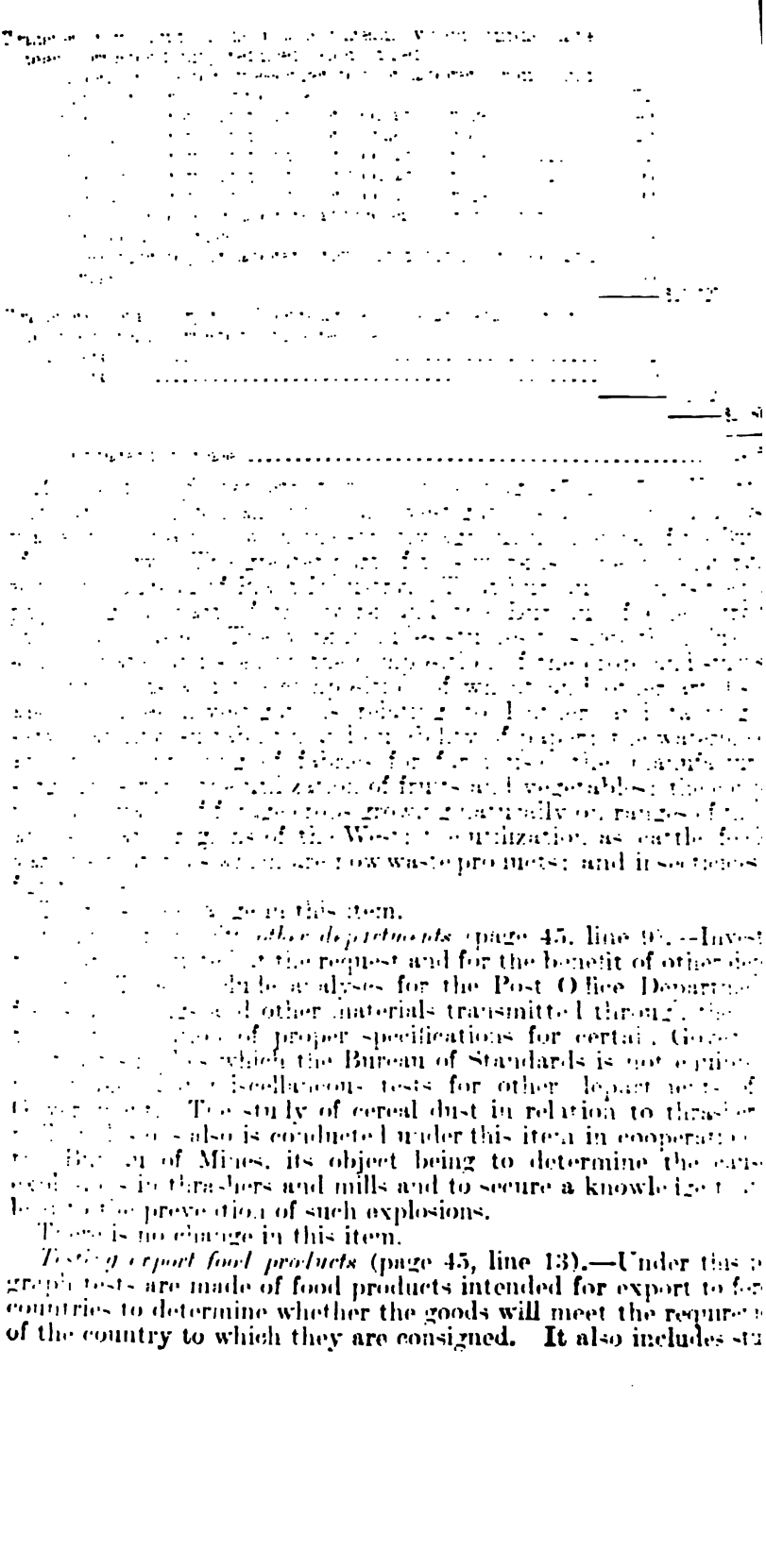
Cooperative brush disposal (page 42, line 24).—This is a new item. provides for the receipt and disbursement by the Government of nds to be deposited by purchasers of timber from national forests to fray the expenses connected with the disposal of brush and débris sulting from timber operations. Where necessary, as a measure of e protection, national-forest timber-sale contracts require that the ush and débris shall be piled and burned. Expenses incurred in is way are now met directly by the purchasers. It has not always en practicable, however, for purchasers to dispose of the brush and bris at the most opportune time on account of the lack of men or e necessity of employing all their available men on other major atures of their operations. It is intended by this item to have the ms required for this purpose placed by the purchasers in a United ates depository, with which sums the Government can, at safe and portune times, directly defray the expenses of brush and débris dis- sal on timber-sale areas to which the deposits are applicable.

BUREAU OF CHEMISTRY.

STATUTORY SALARIES (page 43, line 11).

There is an apparent increase in this item of $24,050, but an actual crease of $250, as indicated by the following table:

omotion: 1 food and drug inspector from $2,000 to $2,250		$250
Actual increase		$250
ansfers from lump funds of this bureau, which funds have been correspondingly reduced:		
3 clerks, class 1, from lump fund for food and drugs	$3,600	
10 clerks, at $900 each, from lump fund for food and drugs	9,000	
1 clerk from lump fund for food and drugs	720	
2 food and drug inspectors, at $1,400 each, from lump fund for food and drugs	2,800	
1 assistant, from lump fund for food and drugs	1,600	



this item.

other departments (page 45, line 9).—Invest
the request and for the benefit of other
analyses for the Post Office Department
and other materials transmitted through
proper specifications for certain Gov
which the Bureau of Standards is not equipped
collaborative tests for other departments
The study of cereal dust in relation to thresher
also is conducted under this item in cooperation
Bureau of Mines, its object being to determine the
in threshers and mills and to secure a knowledge
the prevention of such explosions.

There is no change in this item.

Testing export food products (page 45, line 13).—Under this
graph tests are made of food products intended for export to
countries to determine whether the goods will meet the require
of the country to which they are consigned. It also includes st

ts that are applied to American food products by foreign

s no change in this item.

and egg investigations (page 45, line 22).—The object of estigations is to discover fundamental facts bearing on the ion of quality and the prevention of decay of poultry and e work includes studies of the cause of the breakage of eggs and the devising, testing, and demonstration of methods damage in transit can be decreased. It also involves a methods of freezing and drying eggs, and a study of the f poultry in the packing houses. The information obtained the investigations of the principles of handling eggs and re made available to shippers, carriers, and other interested

s no change in this item.

vestigations (page 46, line 3).—The work under this item tudies of the freezing and cold storage of fish, with the view ting loss through deterioration, and investigations of the ethods of handling, packing, and shipping fish. Chemical of available food fish are made to determine their food d seasonal variations in composition. Investigations of ation of fish waste products and new foods from fish also are . It is highly desirable that the waste which now occurs he failure to utilize many important fish by-products should ated and that our people should learn to consume fish more a supplement to the meat supply.

s no change in this item.

nvestigations (page 46, line 8).—Investigations are conducted s item with a view to develop the best methods of packing, storing, and shipping oysters and other shellfish.

s no change in this item.

cal investigations (page 46, line 11).—This item includes tions to determine the chemical composition of proteins, as a ascertaining their food value; the examination of seeds and ich at present are not used as foods, to ascertain whether tain compounds which might be used to supplement the of other foods; and to determine the nature and amount acids which are found in the mixed proteins of cereals and tuffs. It has been shown that the food value of a protein on the nature and quantity of the amino acids, which are ng stones of the protein, and that certain of these acids are for the growth and maintenance of animals. These studies ad to improvements in methods of feeding. The work also a study of the effect upon health of feeding small quantities ns for long periods and a study of the utilization of hydrog- nale oil.

s no change in this item.

by-products investigations (page 46, line 15).—The object of estigations is to devise commercial methods for the utiliza- ll citrus fruits and especially to increase the quantity and the yield of essential oils from the peel and of the juice from to improve methods of manufacturing citric acid; to extract with flavoring value from the peel; to develop methods for ting and preserving citrus juices by freezing; and to study

and drugs act, the bureau does a great deal of investigational educational work in showing manufacturers how they can im- their products.

ere is an apparent decrease in this item of $2,210, but, as salaries gating $27,210 have been transferred to other rolls, there is an l increase of $25,000. The reasons for this increase are (1) the advance in the price of chemicals used in the analysis of foods lrugs; (2) the large number of cases under the Sherley and net- it amendments to the food and drugs act which will come to next year and which will involve considerable additional expense.

val-stores investigations and demonstrations (page 47, line 13).— bject of this work is to improve methods of grading, weighing, handling naval stores; to encourage the adoption of a definite uniform procedure in the grading, weighing, and handling of and turpentine so that the producer may be paid full value s products and that the buyer may secure delivery of the grade ased; to secure data to serve as a basis for the authoritative tion of standard grades of naval stores and to prepare definite permanent type samples as a basis for trading; and to insure uniform, and simple grading of naval stores. A simple and ate method of grading at the still has been devised. Two tins dealing with adulteration, misgrading, methods of examina- standards, and grading at the still have been published. A ccurate and practical type samples have been prepared and dis- ted for experimental observation under practical conditions. e types have been adopted as official by all trade bodies dealing naval-stores regulations and by the legislature of one State.

has not been possible heretofore, however, on account of the lity to secure the necessary material, to prepare and distrib- o trade bodies and others interested in naval stores a sufficient ber of sets to adequately test them under commercial condi-

A part of the appropriation, therefore, will be used for the ase of necessary material and for assembling and standardizing umber of sets which will be required for this purpose during the fiscal year.

e work on other naval stores is proceeding along similar lines, lefinite type samples will be developed in the near future and buted to the trade for observation under commercial conditions. nvestigations with reference to the grading, weighing, and hand- f naval stores have not been completed and will be continued g the next fiscal year.

w language has been added to authorize the Secretary of Agri- re to demonstrate improved methods or processes of preparing stores and the amount is increased by $5,000 for this purpose. nous losses result from improper methods of handling or pre- g naval stores. If the improved processes or methods which been developed are demonstrated to the producer and the trade pplied in practice, these losses can be considerably reduced.

is item has been transferred from the miscellaneous section of ill to the Bureau of Chemistry, where it properly belongs.

-survey investigations (page 49, line 12).—The object of this is to map and classify the soils of the United States. It con- in surveying, both upon detailed and reconnaissance bases, on rtant areas in various parts of the country, the preparation of s showing the distribution of the soils and of reports containing riptive matter relative to their character, origin, and value for s, and to the agricultural conditions found in each area surveyed. purpose is to acquire knowledge of the soils of the United States to make it available for the use of other bureaus and depart- ts, agricultural colleges, experiment stations, and others en d in the development of agriculture. The work is conducted operation with the States.

here is no change in this item.

lassification of agricultural lands (page 49, line 18).—The object his work is to assist the Forest Service in the classification and negation of agricultural lands in the national forests. To accom- h this result maps and charts are prepared indicating by colors otherwise the character of the soils and their value for agricultural poses.

There is an apparent decrease in this item of $1,900, due to the nsfer of that amount to the statutory roll.

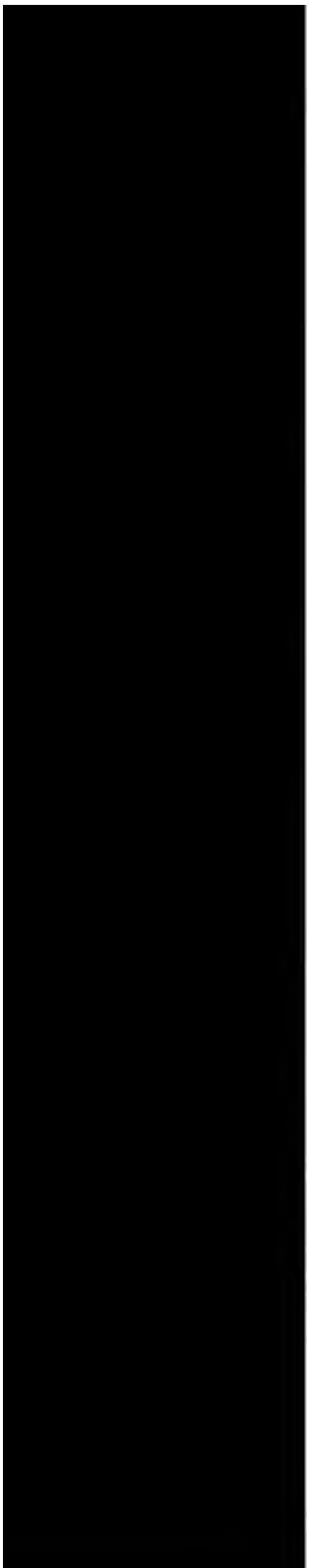
Administrative expenses (page 49, line 21).—There is an increase this item of $800.

BUREAU OF ENTOMOLOGY.

STATUTORY SALARIES (page 50, line 2).

There is an apparent increase in this item of $29,650, but an actual ncrease of $480, as indicated by the following table:

ew place: 1 messenger boy	$480
Actual increase	480
ansfers from lump funds of this bureau, which funds have been cor- espondingly reduced:	
1 administrative assistant, from moths	$2,250
2 clerks, class 1, from miscellaneous insects	2,400
1 clerk, from cereal and forage insects	1,000
1 clerk, from southern field-crop insects	1,000
1 clerk, from truck-crop insects	1,000
1 clerk, from truck-crop insects	900
1 clerk, from southern field-crop insects	900
4 clerks, at $840 each, from cereal and forage insects	3,360
1 clerk, from southern field-crop insects	840
1 entomological preparator, from truck-crop insects	1,000
1 entomological preparator, from truck-crop insects	840
1 entomological preparator, from tropical insects	840
2 entomological preparators, at $720 each, from southern field-crop insects	1,440
3 entomological preparators, at $720 each, from forest insects	2,160
1 entomological preparator, from deciduous-fruit insects	720
1 entomological preparator, from moths	720
1 entomological preparator from forest insects	600
1 messenger or laborer, from miscellaneous insects, with change of title from 1 messenger, $900	900
1 messenger or laborer, from forest insects, with change of title from 1 unskilled laborer, $900	900
1 messenger or laborer, from tropical insects, with change of title from 1 unskilled laborer, $840	840



uthern field-crop insect investigations (page 51, line 14).—These stigations deal with insect pests of cotton, tobacco, sugar cane, rice, and are planned with a view to develop practical methods control. Especial attention is given to the Mexican cotton boll evil.

There is an apparent increase in this item of $5,400, but, as salaries ggregating $4,600 have been transferred to the statutory roll, the ctual increase is $10,000. This sum will be used for the extension f the investigations relating to the tobacco hornworm.

Forest insect investigations (page 51, line 18).—Field investigations of insects attacking forest and shade trees and forest products, for the purpose of determining practical methods of preventing losses and giving expert advice as to their application, are carried on under this item.

There is an apparent decrease in this item of $4,020, due to the transfer of that amount to the statutory roll.

Truck-crop and stored-product insect investigations (page 51, line 19).—This item includes investigations in the control of cutworms, wireworms, white grubs, and other general insect pests; special insect pests affecting sugar beets and vegetables, including cauliflower, onions, asparagus, beans and peas, tomatoes, cucumbers and melons, celery, sweet potatoes, and minor truck crops; mushroom insects; and insects affecting stored products, with the exception of those injurious to wood fabrics and tobacco. Special attention also is being given to insects injurious to potatoes, including the Colorado potato beetle and the potato tuber moth, and to the development of new types of spray machinery especially adapted to crops such as onions. New fumigants for mills, warehouses, elevators, and other receptacles for stored grains are being studied. Investigations also are being conducted on insects injurious to animal foods.

There is an apparent increase in this item of $1,260, but, as $3,740 has been transferred to the statutory roll, the actual increase is $5,000. This sum will be used for the investigation of insects which are instrumental in the carriage of diseases affecting cucumbers and cucumber plants. This increase was recommended by the department in a supplemental estimate.

Bee-culture investigations (page 51, line 23).—Under this item special attention is given to the methods of wintering bees, with chief emphasis at present on the proper temperature of the bee cellar and methods of preparing bees for wintering outdoors. The ultimate object is to furnish helpful information to the beekeeper. Bee diseases also are being thoroughly studied.

The words "and demonstrations" have been added to this paragraph and the appropriation increased by $5,000, so that the results which have been secured through the investigational work may be demonstrated to beekeepers in cooperation with the States Relations Service.

Tropical and subtropical insect investigations (page 52, line 1).—The work includes investigations relating to insects affecting citrus fruits, olive, fig, and other tropical and subtropical fruits, including the white fly and scale. The use of hydrocyanic-acid gas and other means of controlling these insects are studied.

There is an apparent decrease of $3,000 in this item, due to transfers to the statutory roll.

Investigations of the Mediterra
line 4[illegible].—Under this item speci
study of the life history of the M
and pineapples, the only fruits p
to the mainland, are carefully i
been made of the conditions un
ranean regions in order to ascer
importing it from those areas.

The language of the paragraph
for the investigation of species of
Mediterranean fly and to authe
Horticultural Board in controllir

There is no change in the am

Miscellaneous insect investigat
provides for investigations relati
man and domestic animals and
systematic classification of misce

There is an apparent increase
has been transferred to the sta
cluded in a separate item for ad
crease is $10,000. This increase
the work in connection with ins
animals, including particularly
nose fly and of horseflies.

Administrative expenses (page
tion heretofore has been made fc
Bureau of Entomology, the great
charged against the appropriatic
tions. The amount carried by
that appropriation, so that no a

PREVENTING SPREAD O

The gipsy and brown-tail m
forests in the New England Sta
tion of their further spread is ur
moth is prevented chiefly by ri
spread, by the spraying of tree
newly infested districts, and by
cultural Board in the quarantine
from the territory infected. .
assemblage, study, and liberatio
These parasites have increased
done excellent work in checkin
is being outlined for the manag
believed, will result in a very gre

There is an apparent decreas
transfer of that amount to the s

New language has been adde
medical supplies and services an
immediate relief of foremen, se
who may be injured while fellin
applying creosote, spraying arse
hazardous operations in connec

cidents have occured in previous years. A similar provision is cluded in the Forest Service appropriation.

BUREAU OF BIOLOGICAL SURVEY.

STATUTORY SALARIES (page 53, line 11).

There is an apparent increase in this item of $9,560, but, as that amount has been deducted from the lump-fund rolls, no actual change is involved. The following table shows the transfers which have been made to the statutory roll:

Transfers from lump funds of this bureau, which funds have been correspondingly reduced:	
1 clerk, class 3, from administrative expenses	$1,600
1 clerk, class 2, from game preservation	1,400
1 clerk, class 2, from food habits of birds and mammals	1,400
1 clerk, from protection of migratory birds	1,260
1 clerk, from food habits of birds and mammals	1,080
1 clerk, from administrative expenses	840
1 clerk, from food habits of birds and mammals	720
1 preparator, from food habits of birds and mammals	900
1 messenger boy, from food habits of birds and mammals	360
Apparent increase	9,560

GENERAL EXPENSES.

Enforcement of the Lacey act (page 54, line 3).—This item provides for the enforcement of the Lacey act, which has for its object the prevention of entry into the United States of injurious birds and mammals and the regulation of the interstate shipment of game killed in violation of local laws.

There is an apparent decrease in this item of $1,400, due to the transfer of that amount to the statutory roll.

Maintenance of mammal and bird reservations (page 54, line 15).—This item provides for the maintenance of three national game preserves, stocked with big game, to assist in preserving buffalo, elk, and antelope, which are threatened with extinction. These reservations are located at Dixon, Mont.; Wind Cave National Park, S. Dak.; and Jackson Hole, Wyo. It also provides for the protection of the birds on the 69 national bird reservations and for warden service. Two thousand five hundred dollars is set aside for restocking the national reservations, including the transfer of elk, deer, and such other game as may be obtainable for the purpose.

Sullys Hill game preserve (page 55, line 4).—In the appropriation act for the fiscal year 1915, an appropriation of $5,000 was made for the improvement of the game preserve in Sullys Hill National Park, N. Dak. A similar sum was included in the appropriation act for the present fiscal year. It was thought at the time that $10,000 would be sufficient to provide for the fencing of the preserve and the construction of the necessary buildings, corrals, roads, etc. It was found, however, that the fencing alone would cost nearly $10,000. The contract has been let for the construction of the fence, which will be completed by June 30, 1916, but no funds are available for making improvements on or for stocking the preserve. An item of $5,000 accordingly has been included in the bill for the fiscal year

ils, and plants to the natural climatic and crop areas within the ates.

There is no change in this item.

Enforcement of the migratory-bird law (page 56, line 11).—This item rovides for the enforcement of the act of Congress approved March 1913, known as the migratory-bird law. The work is done by field spectors in cooperation with local authorities, both in the enforce- ent of the law and in educational work, to build up public sentiment r its observance. An important investigation also is being con- ucted to determine the status of migratory wild fowl and conditions their principal haunts for the purpose of obtaining information hich may be utilized in making provision for their conservation nd increase.

While there is apparently no change in this item, there is an actual crease of $1,260, due to the transfer of that amount to the statutory ll.

Administrative expenses (page 56, line 19).—There is an apparent ecrease in this item of $760, but as $2,440 has been transferred to he statutory roll, the actual increase is $1,680. This additional m is to be used for traveling expenses in cooperative work, mainly ith the Forest Service, in connection with the conservation and crease of game in the national forests.

DIVISION OF ACCOUNTS AND DISBURSEMENTS.

(Page 57, line 1.)

There is no change in the appropriation for this division.

DIVISION OF PUBLICATIONS.

STATUTORY SALARIES (page 57, line 14).

There is an apparent increase in this item of $2,530, but an actual increase of $4,090, as indicated by the following table:

Promotion: Chief of division, from $3,250 to $3,500	$250	
New places:		
2 skilled laborers, at $720 each	1,440	
1 draftsman or photographer	1,200	
Transfers from lump fund for extra labor of Secretary's Office, which fund has not been correspondingly reduced: 2 laborers, at $600 each	1,200	
Actual increase		$4,090
Transfers to statutory roll of Secretary's Office and statutory roll of this division correspondingly reduced:		
1 skilled laborer	840	
1 skilled laborer	720	
		1,560
Apparent increase		2,530

GENERAL EXPENSES.

Labor-saving machinery (page 58, line 23).—There is an increase in his item of $1,000 to provide new machines, replace worn-out parts, nd to purchase ink, stencil blanks, type, ribbons, and other supplies

For three additional field agents, one each in California, Texas, New Mexico, $4,824.

For two fruit field agents to report upon fruit conditions and one crop specialist to have general charge of the collection of fruit-crop data in the United States, $5,216.

For two truck-crop specialists, $3,216.

For the traveling expenses of these new agents, $12,000, and their necessary supplies and equipment, $1,600.

LIBRARY.

STATUTORY SALARIES (page 60, line 17).

There is an apparent increase in this item of $1,800. The actual increase is only $60, as will be seen from the following table:

Promotions: 3 clerks at $1,000 each, to 3 clerks at $1,020 each	$60	
Actual increase		$60
Transfers from lump fund of the library, which fund has been correspondingly reduced:		
1 messenger boy, with change of title to messenger, messenger boy, or laborer	$360	
1 charwoman	480	
	840	
Transfer from statutory roll of Secretary's Office, which roll has been correspondingly reduced: 1 clerk	900	
		1,740
Apparent increase		1,800

Change of title: 1 messenger, messenger boy, or laborer, $360, in lieu of 1 messenger boy, $360, from lump fund.

GENERAL EXPENSES (page 61, line 3).

There is an apparent increase in this item of $1,700, but, as $840 has been transferred to the statutory roll, the actual increase is $2,540. This sum is to enable the library to keep pace with the growth of the department and with the greatly increased volume of current scientific literature. It is obvious, of course, that the library of the Department of Agriculture, representing possibly the greatest single collection of agricultural literature, is of inestimable value to the conduct of the work of the department.

MISCELLANEOUS EXPENSES.

Miscellaneous expenses, Department of Agriculture (page 61, line 12).—This item covers the purchase of stationery and miscellaneous materials for the various sections under the office of the Secretary. It also includes the purchase of forage, fuel, light, and other incidental expenses for the various bureaus and divisions of the department in the city of Washington.

There is no change in the amount carried by the item.

The word "grounds" has been omitted because provision has been made for the maintenance of the grounds of the department in the city of Washington from the appropriation for gardens and grounds in the Bureau of Plant Industry.

ration of a report to Congress on the work and expenditures of tations; also, the preparation of the Experiment Station Rec- which contains summaries of the reports of more than 1,000 ultural institutions throughout the world. The total expendi- s of the stations in the United States through Federal and State ces aggregate annually over $5,000,000; (2) the administration he cooperative agricultural extension work carried on under the isions of the agricultural extension act of May 8, 1914, and the aration of a report to Congress on the operation of the act in the eral States.

There is an apparent decrease in this item of $1,000. On account of nsfers to the statutory roll, and also the transfer of the proviso ting to administrative expenses, with the amount carried by it, another part of the bill, there is an actual increase of $20,000. is sum will be used in connection with the increased work incident the administration of the agricultural extension act.

The committee deemed it wise to follow the practice obtaining in her bureaus and provide for the general administrative expenses a separate item, which will be found on page 66, at line 16, of the bill.

Farmers' cooperative demonstrations outside of the cotton belt (page 64, line 17).—This item has for its object the giving of instruction and demonstrations in agriculture in the 33 Northern and Western States, by means of county agents, in order to secure the adoption of better farm practice, organizations, and administration to the end of increasing the profits of farming and improving rural social life; the organization of boys' and girls' clubs in order to teach better methods of farm, garden, and home practice, and to bring them in touch with the work of the department and of the agricultural colleges and schools with a view to make them useful and successful workers, home makers, and citizens; and farm-management demonstrations to demonstrate to farmers the importance of certain efficiency factors relating to the organization and administration of the farm and to increase the efficiency of the county-agent work. The item provides for the business of the Washington office in its administrative and cooperative relations with the demonstration and extension work in 33 Northern and Western States and the cooperative employment of 507 men demonstration agents located in those States.

There is an apparent increase in this item of $92,160, but, as $7,840 has been transferred to the statutory roll, the actual increase is $100,000. This increase was not included in the original estimates. The Secretary of Agriculture, however, stated to the committee when he appeared before it that $100,000 could be used profitably during the next fiscal year to meet the demand for the enlargement of the extension work in the Northern and Western States. He also transmitted to the committee a letter indicating that the increase, if granted, would be used in the following manner:

1. Extension work among farm women, $15,400.
2. Boys' and girls' club work, $30,000.
3. Farm-management demonstrations, $19,500.
4. County-agent work, $35,100.

The committee believes that these lines of work should be extended in those sections demanding it and that they be developed as rapidly as possible.

a Guam, special efforts are being made to develop agriculture so the island may become self-supporting. Corn, cotton, rice, and ge crops are being grown and improved live stock is being introed.

here is an increase in the total amount carried by this paragraph $23,000. This sum will be apportioned as follows:

. Alaska, $8,000. Heretofore, there have been available for the e of the Alaska stations the funds realized from the sale of products sed at the stations, which, during the past fiscal year, amounted nearly $8,000. Under the law, such funds must now be deposited the Treasury to the credit of miscellaneous receipts. The committee thought it wise to restore this amount, so that the work may conducted on a scale which was possible when the funds accruing m the sale of products were available.

2. Porto Rico, $10,000, to enable the department to organize monstration and extension work among the large agricultural pulation of Porto Rico. Formerly $4,000 was derived annually m the sale of agricultural products at this station, so that the ual increase in the funds available will be only $6,000.

. Hawaii, $5,000. Of this amount, $2,000 will offset a like amount herto realized annually from the sale of products. The remaining 000 will be used for experimental work with forage crops at the gestion of and in cooperation with the War Department, which experienced great difficulty in securing at reasonable prices per forage for the horses which it maintains on the island, it being essary to import forage from the mainland.

Home-economics investigations (page 66, line 7).—Under this item tudy of agricultural products, with reference to their use in the me for food, clothing, and equipment, and the household tasks ich their use involves, is made. The work has included scientific l practical investigations of different foods and rations with refere to their actual nutritive value and their economy in the diet. large amount of both general and specific information has been ought together, which enables the housekeeper to understand her terials and to use them to good advantage. A study of an emerncy ration, undertaken in cooperation with the War Department, s been completed and a report prepared for publication. Publiions based on these investigations are very generally used in colges, schools, and farmers' institutes throughout the country wher er home economics is taught. The extension work among the farm men, now rapidly being developed under the extension act, has led greatly increased demand for information, which can only be furished through such investigations as are provided for by this item. There is an apparent decrease of $2,280, due to the transfer of that ount to the statutory roll.

Administrative expenses (page 66, line 16).—The administrative penses of the States Relations Service heretofore have been proled for under the item for the administrative supervision of the tch, Adams, and extension acts. In accordance with the plan folved in other bureaus of the department, the amount used for this rpose under that item has been set forth in a separate paragraph. The amount used for administrative expenses during the present al year is $20,100, while the amount carried by the item is only 3,280. There is therefore an apparent decrease of $3,820, but, as

...d management investigations (page 68, line 9).—This item has ... principally with the business management of roads. It covers ...n statistical inquiries regarding road management and revenues ...xpenditures for road purposes within the various States; the ...ilation of road laws and the giving of assistance and advice ... reference to the drafting of State laws designed to introduce ...best practical systems of road management; studies of the ...cial burdens and economic benefits accruing to communities ... the building or improvement of roads; economic studies of ... roads to obtain the data called for under the act of August 24, ... (37 Stat., 552), which authorized the construction of post roads; ...ies of State highway departments and of county and township road ...tems, including organization, methods of financing, records, etc.; ... taking of traffic censuses in selected localities for the purpose of ...termining the adaptability of various types of road surface to ...rying traffic conditions. Studies also are made of the systems ... utilizing convict labor in road building. As a result of these ...udies, the Office of Public Roads and Rural Engineering has devel...ed certain principles with regard to the handling of convicts in ...nnection with the building of roads. In cooperation with several ...tates and counties it has induced the establishment of demonstra...ion camps and plants in which these principles will be applied in ...ractice. The States and counties bear all expenses connected with ...he actual operation and maintenance of the camps. The office ...meets such expenses as are necessary to make the proper observation ...and record of the results obtained.

While the advice given under the other general expense items is specific in character and usually deals with highly technical subjects, the advice contemplated under this item is somewhat broader in scope and includes questions of business management, such as organization, methods of financing, improvements, systems of cost keeping, and recommendations of road construction and maintenance. A collection of miniature models illustrating the various types of road construction are exhibited in cooperation with States and counties under this item.

There is an apparent decrease in the amount carried in this paragraph of $3,060, but as salaries aggregating $8,060 have been transferred to the statutory roll, the actual increase is $5,000. This amount will be used for additional supplies, equipment, and traveling expenses.

Road building and maintenance investigations (page 68, line 12).—Under this item the principal activity consists in the assignment of engineers to give specific engineering advice to county and State officials regarding the building and maintenance of roads, culverts, and bridges. This includes, in addition to the engineering questions, the location and field examination of materials that may be locally available for the building of roads. Engineers also are assigned to supervise the building of short sections of roads in various parts of the country which will serve as object lessons. In each case the entire cost of the construction of the road is paid by the local authorities. Investigations as to the physical features of road maintenance as distinguished from the business management of road maintenance, are made for the purpose of better enabling the engineers to give specific advice on road maintenance when called upon to do so.

in conduits of various kinds, and to work out new formulas
that conduits may be properly designed to carry the water
ey are intended to convey; to improve and standardize de-
measuring water for irrigation; and to determine the effect
is, regulations, and laws upon the economic use of water in
and upon the success of irrigational development.
is an apparent decrease in this item of $3,000, but, as that
as been transferred to the statutory roll, there is no actual
the amount.
drainage investigations (page 69, line 16).—This work has
ject the investigation of problems connected with the con-
, operation, and maintenance of drainage improvements; the
pecial problems of controlling soil moisture in peat and muck
for agriculture; the designing of farm drains with particular
to proper depth, spacing, and capacities of tile drains and
hes; the designing of terraces to prevent erosion of hillside
e development of methods for overcoming and preventing
lands under irrigation caused by waterlogging or accumula-
jurious salts in the surface soil; studies of the organization,
, and legal regulation of drainage districts; the determina-
he rates of run-off for which provision should be made by
channels to reclaim wet lands; and the proper designing of
reclamation of tidal marshes. Where the work done will be
l educational value in the improvement or reclamation of
as similarly situated, assistance is given to individual land
planning and constructing farm drains and terraces and to
ties in organizing drainage districts and properly planning
ovement works.
is an apparent decrease in this item of $1,560, due to the
f that amount to the statutory roll.
rural engineering problems (page 70, line 6).—The work
s item covers investigations relating to farm domestic water
nd drainage disposal, the construction of farm buildings,
r rural engineering problems involving mechanical principles.
tions are made to determine present practices in domestic
pply, in drainage disposal, and in constructing farm build-
h a view to develop practical plans for the farmstead, its
, and their accessories. The better examples are studied,
upon if possible, and the results made available through
ons. Field investigations also are conducted in the north-
at belt to discover the cause of dust explosions in threshing
and to devise preventive measures. This work is done in
on with the Bureau of Chemistry. Assistance also is ren-
e pathologists and entomologists of the department in
improved spraying apparatus.
s an apparent increase in this item of $7,195, but, as salaries
ng $1,800 have been transferred from the Bureau of Animal
to this item, the actual increase is $5,395. This increase
sed for extending the work done under this paragraph.
istrative expenses (page 70, line 12).—There is no change in

nsfers from lump funds of this office, which funds have been correspondingly reduced—Continued.

2 laboratory aids, at $900 each, from cotton-futures act and cotton standards	$1,800
1 laboratory aid, from cotton testing	720
2 laboratory aids, at $720 each, from cotton-futures act	1,440
1 photographer, from cotton-futures act	1,400
1 photographer, from administrative expenses	1,200
1 telegraph operator, from cotton-futures act	1,200
1 map tracer, from cotton testing	900
1 map tracer, from cotton-futures act	480
1 laborer, from administrative expenses	720
1 laborer, from cotton-futures act	660
2 messenger boys or laborers, at $600 each, from marketing and distributing farm products and cotton-futures act, with change of title from laborers, at $600 each	1,200
1 messenger boy or laborer, from marketing and distributing farm products, with change of title from messenger boy	540
2 messenger boys or laborers, at $540 each, from cotton-futures act	1,080
2 messenger boys or laborers, at $480 each, from marketing and distributing farm products, with change of title from messenger boys, at $480 each	960
2 messenger boys or laborers, at $480 each, from cotton-futures act, with change of title from laborers, at $480 each	960
1 messenger boy, from marketing and distributing farm products	420
2 charwomen, at $480 each, from cotton testing and administrative expenses	960
1 charwoman, from cotton standards	300
2 charwomen, at $240 each, from marketing and distributing farm products and rural cooperation	480
	$58,200
Apparent increase	73,480

Change of title:

1 clerk, at $720, in lieu of 1 assistant multigraph operator, at $720.

1 mechanical assistant, at $1,380, in lieu of 1 assistant in agricultural technology, at $1,380.

4 messenger boys or laborers, at $600 each, in lieu of 2 messenger boys, at $600 each, and 2 laborers, at $600 each.

4 messenger boys or laborers, at $540 each, in lieu of 1 laborer, at $540, 1 messenger boy, at $540, and 2 unskilled laborers, at $540 each.

8 messenger boys or laborers, at $480 each, in lieu of 6 messenger boys, at $480 each, and 2 laborers, at $480 each.

GENERAL EXPENSES.

Marketing and distribution (page 71, line 19).—Under this item studies are conducted which cover market conditions; demands for specific crops, sources of supply, methods of grading, standardizing, packing, and shipping; the nature of the commercial transactions by means of which farm produce moves from the farm to the consumer; waste in marketing; profits in handling farm products with means for reduction of those which are excessive; and cooperative associations of farmers.

This item is divided into the following projects, or lines of investigation: Cotton handling and marketing; cooperative purchasing and marketing; market surveys, methods, and costs; market grades and standards; city marketing and distribution; transportation and storage; marketing by parcel post and express; marketing live stock, meats, and animal by-products; marketing business practice; grain, seeds, and hay marketing investigations; marketing cotton seed and

l, economic, and educational conditions of women and children
gh the work of women's rural organizations.
ere is an apparent decrease of $3,060 in this item, but as that
nt has been transferred to the statutory roll there is no actual
ge.

te cooperation in marketing work (page 73, line 1).—This is a
item. It has for its purpose the coordination of the investiga-
s of the Department of Agriculture relating to marketing with
lar activities undertaken by the individual States. While
tofore no definite provision has been made for work of this
racter, allotments have been made from available funds for special
perative marketing investigations and demonstrations in four
tes. A large number of States have appropriated funds for mar-
ing work, and definite requests for the assistance of the Federal
vernment have been received from 25. The committee believes
t the work contemplated by the item is particularly important,
cause it undoubtedly will bring about a desirable degree of uni-
mity in the conduct of the marketing activities of a large number
States. It is thought that the most economical and efficient means
effecting this coordination is the employment of cooperative mar-
ting advisers, to be stationed in the respective States. The sala-
es and expenses of these officers will be borne jointly by the Federal
overnment and the States. They will be thoroughly conversant
ith the marketing activities of both agencies and will form the con-
ecting link between them, thus making available to each the results
f the investigations of the other. The sum carried by the item will
rovide for the employment of 10 marketing advisers and for the
xpenses connected with the supervision and coordination of their
ctivities.

Administrative expenses (page 73, line 6).—There is an apparent
lecrease in this item of $3,750, but, as $11,300 has been transferred
o the statutory roll, the actual increase is $7,550. This increase is
nade necessary by the growth of the investigational projects of the
office and the consequent increase in administrative duties and
clerical work.

UNITED STATES COTTON-FUTURES ACT.

Enforcement of the United States cotton-futures act (page 73, line 11).—Under the authority conferred by the cotton-futures act such data are collected as may be necessary to determine what markets are bona fide spot markets, and necessary activities are conducted in order to prescribe rules and regulations, establish and promulgate standards for cotton, and furnish forms thereof to the trade. When disputes arise between the person delivering cotton and the person receiving the same in the settlement of future contracts, questions of grade, staple, and quality are determined by the Office of Markets and Rural Organization under the authority of the Secretary.

There is an apparent increase in this item of $45,750, but, as salaries aggregating $22,990 have been transferred to statutory rolls, the actual increase is $68,740. The cotton-futures act of August 18, 1914, carried a continuing appropriation of $150,000 for its enforcement. Of this sum, $85,000 is available for expenditure during the present fiscal year. The current appropriation act also contains an item for

$75,000, making a total of $160,000 available for the enforcement o the act during the present fiscal year. It is anticipated that for th next fiscal year there will remain a balance from the continuin appropriation of approximately $15,000, which, with the amoun specifically asked for in the estimates, $120,750, and transfers to th statutory roll involving $22,990, would make available a total $158,710 for the fiscal year 1917, or approximately $1,300 less th the total amount available this year.

ENFORCEMENT OF THE INSECTICIDE ACT.

The appropriation for the enforcement of the insecticide act h been transferred from the miscellaneous section of the bill to present location and redrafted to provide appropriations for statute salaries and general expenses, in accordance with the practice follow in other offices and bureaus of the department.

STATUTORY SALARIES (page 74, line 2).

This is a new statutory roll created by the transfer of all clerical a subclerical employees from the lump fund for the enforcement of t insecticide act, which fund has been correspondingly reduced. The transfers are indicated by the following table:

Transfers from lump fund for enforcement of the insecticide act, which fund has been correspondingly reduced:

1 executive officer	$2,750
1 executive assistant	2,000
1 clerk, class 3	1,600
1 clerk, class 2	1,400
1 clerk, class 1	1,200
2 clerks, at $1,140 each	2,280
2 clerks, at $1,000 each	2,000
3 insecticide and fungicide inspectors, at $1,600 each	4,800
2 clerks and sample collectors, at $1,000 each	2,000
1 laboratory helper	840
1 laboratory helper	720
1 laboratory helper	600
1 unskilled laborer	600
1 unskilled laborer	480
1 messenger boy	480
1 messenger boy	360
1 charwoman	480
	$24

GENERAL EXPENSES.

Enforcement of the insecticide act (page 74, line 17).—The insecticide act of 1910 has been in operation since January 1, 1911. The a gives the Department of Agriculture control over all insecticides a fungicides which enter interstate commerce or are sold or manufa tured in the District of Columbia or the Territories, and those offer for import into the United States at the various ports of entry.

A brief classification of the various products coming within th scope of the provisions of the act is as follows: Agricultural sprayi materials, such as lead arsenate, Paris green, bordeaux mixture, lim sulphur solution, and the thousand of proprietary preparations whi are sold throughout the United States; products used to rid the hous hold of insects of all kinds; disinfectants, germicides, etc., which a claimed to be efficacious to combat or kill bacteria; those insecticid

fungicides which are for use on cattle, horses, swine, sheep, goats, other domestic animals or are to be used in the treatment of terial and parasitic infections on such animals and also fowls. There is an apparent decrease in this item of $19,590, but as aries aggregating $24,590 have been transferred to the statutory l, the actual increase is $5,000. This sum will be used to employ d pay the expenses of additional scientists who are needed to alyze and test the increasing number of samples collected under provisions of the act. Special attention will be given to disectants and germicides.

FEDERAL HORTICULTURAL BOARD.

The title of the item for the enforcement of the plant-quarantine has been changed to "Federal Horticultural Board." The paraph has been transferred from the miscellaneous section of the bill its present location and redrafted to provide appropriations for utory salaries and general expenses to conform to the practice owed in other bureaus and offices of the department. The Fed- Horticultural Board, which was created by the plant-quarantine is charged with the enforcement of the act under the direction of Secretary.

STATUTORY SALARIES (page 75, line 2).

This is a new statutory roll created by the transfer of clerical and clerical employees from the lump fund. These transfers are shown the following table:

nsfers from lump fund for the Federal Horticultural Board, which fund has been rrespondingly reduced:

cretary of board	$2,280
rks, at $1,440 each	2,880
rks, class 2	2,800
rks, at $1,260 each	2,520
rk	1,080
rk	1,000
essenger boy	480
essenger boy	360
arwoman	240
	13,640

GENERAL EXPENSES (page 75, line 12).

Enforcement of the plant-quarantine act.—Under the plant-rantine act there are being maintained and enforced six domestic rantines and nine foreign quarantines. The Mediterranean fruit- and melon-fly quarantine is perhaps the most important of the nestic quarantines. A strict enforcement of the regulations under s quarantine has so far prevented the entrance and establishment hese two dangerous insects through fruits and vegetables from the ritory of Hawaii. The further spread in this country of two danous date-palm scale insects is being prevented, and control work w under way indicates that these two insects eventually may be erminated. Absolute universal quarantines, including the Terriies of Hawaii and Porto Rico, against sugar cane and cotton seed, latter on account of the pink boll worm, are of the greatest imtance. The pink boll worm, which is doing enormous damage to

TEN PER CENT TRANSFE

MISCELLANEOUS

devoted his time to the promotion of some particular industry or all group of industries by encouraging the farmers to organize associations and giving them information in regard to the problems which the farmers meet in connection with these industries. Work on the Boise, Minidoka, Uncompahgre, and Tieton projects is devoted to dairying and other live-stock industries; on the Huntley and Truckee-Carson projects, to dairying and swine production; on the North Platte project, to hog production; and on the Shoshone project, to dairying and swine production. The work on the Umatilla project is devoted to field-crop production. On most of the projects the work has not been under way long enough to show any definite results. On the North Platte project, where work was begun July 1, 1914, considerable progress has been made in the control of hog cholera. The disease has been brought under control, the number of cases in 1915 having been only about one-fourth as great as of those occurring in 1914. The shipments of hogs in 1915 amounted to about $500,000. Now that cholera is under control, more attention is being paid to improvements in feeding, breeding, housing, and marketing methods. On the Truckee-Carson project the work has been directed largely toward the importation of dairy stock and to improved methods of dairying. More than 600 head of stock were imported to the project in 1915. On the Boise and Minidoka projects the farmers have been assisted in combating hog cholera and in improving their methods of feeding, breeding, and marketing live stock.

There is no change in this item.

COOPERATIVE FIRE PROTECTION OF FORESTED WATERSHEDS OF NAVIGABLE STREAMS (page 76, line 16).

This appropriation is used in cooperating with States in the protection of forested watersheds of navigable streams. It is confined to States that have provided by law for a system of forest fire protection. An area of approximately 13,000,000 acres is protected at an average cost of about three-fourths of a cent an acre. The Federal expenditures, however, are less than one-fifth of those of the States, while the funds spent by private owners, including some 40 timber-protective associations, probably equal the Federal and State expenditures combined. Twenty States are now cooperating with the Government under section 2 of the Weeks forestry law of March 1, 1911, and it is reasonably certain that two additional States will execute agreements during 1916.

There is no change in this item.

EXPERIMENTS AND DEMONSTRATIONS IN LIVE-STOCK PRODUCTION IN THE CANE-SUGAR AND COTTON DISTRICTS (page 77, line 3).

A miscellaneous item in the appropriation bill for the fiscal year ended June 30, 1915, provided $60,000 for experiments and demonstrations in live-stock production in the cane-sugar and cotton districts of the United States. A committee consisting of the Chief of the Bureau of Plant Industry, the Chief of the Dairy Division of the Bureau of Animal Industry, and the director of the Louisiana Experiment Station, who also is the director of the extension service of the Louisiana State University, was appointed to administer this fund.

PASSENGER-CARRYING VEHICLES (page 77, line 14).

ompliance with the provisions of section 5 of the legislative,
ive, and judicial appropriation act of July 16, 1914 (38 Stat.,
a paragraph is included authorizing the expenditure of not
ing $70,000 from the lump-sum appropriations of the various
s for the purchase, maintenance, repair, and operation of motor-
ed and horse-drawn passenger-carrying vehicles and motor
or the conduct of the field work of the Department of Agricul-
This paragraph does not carry any appropriation. It simply
the specific authority required by the act of July 16, 1914.

ATION OF FOOT-AND-MOUTH AND OTHER CONTAGIOUS DISEASES OF ANIMALS (page 78, line 7).

paragraph is similar to that included in the appropriation act
fiscal year 1916. It provides a permanent emergency fund to
the Secretary of Agriculture to take prompt and effective action
s of outbreaks of foot-and-mouth disease, rinderpest, con-
pleuropneumonia, and other contagious and infectious dis-
f animals which may threaten the live-stock industry of the
y. It is in the nature of an insurance fund against such de-
ve diseases, and the amount appropriated will not be used unless
mergencies as are contemplated by the language of the para-
actually arise.

ay not be out of place here to give a brief statement regarding
tbreak of foot-and-mouth disease which was discovered in the
y of Niles, Mich., in October, 1914. Unfortunately, the mild
nd atypical appearance of the first cases permitted the dis-
spread without recognition to a considerable number of
f cattle and hogs. Some of the latter reached and presum-
fected the stockyards at Chicago, from which the disease was
inated to other stockyards and to points north, east, south,
est. As a result, a widespread outbreak has passed over the
States, the most serious and extensive that has ever oc-
in this country, involving 22 States and the District of Colum-
places ranging from the Atlantic to the Pacific coast. By
915, all known infected and exposed animals had been slaugh-
and it appeared that the disease had been eradicated. How-
nfection was again discovered in Steuben County, N. Y., on
8, although no infection had previously been found in that
. Again, on August 8, the discovery was made that reinfection
curred in Illinois and it was ascertained that this recurrence
disease was due to infected hog-cholera serum. This serum
oduced at an establishment where foot-and-mouth disease was
own to exist at any time, and had been carefully tested for the
, with negative results, before any of it was allowed to be sent
d used. It was only after repeated tests, involving 62 animals,
en made, that one of the animals in the last series developed
sease, thereby demonstrating that the serum was infected.
; this recurrence of the disease 12 counties became infected and
found necessary to slaughter some 400 herds, most of which
mall.

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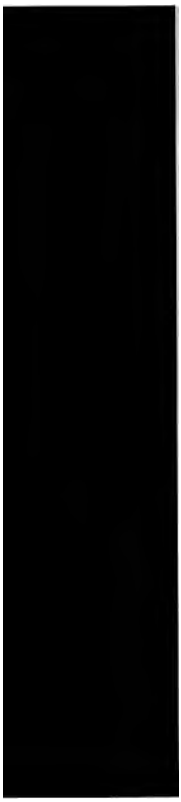

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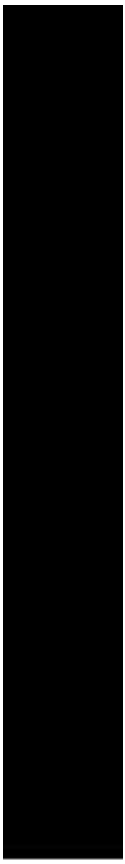

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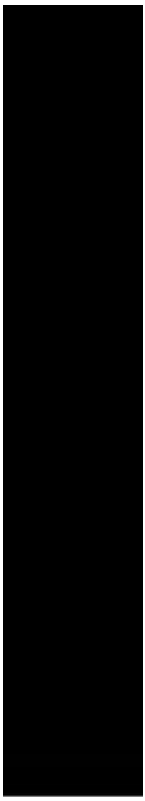

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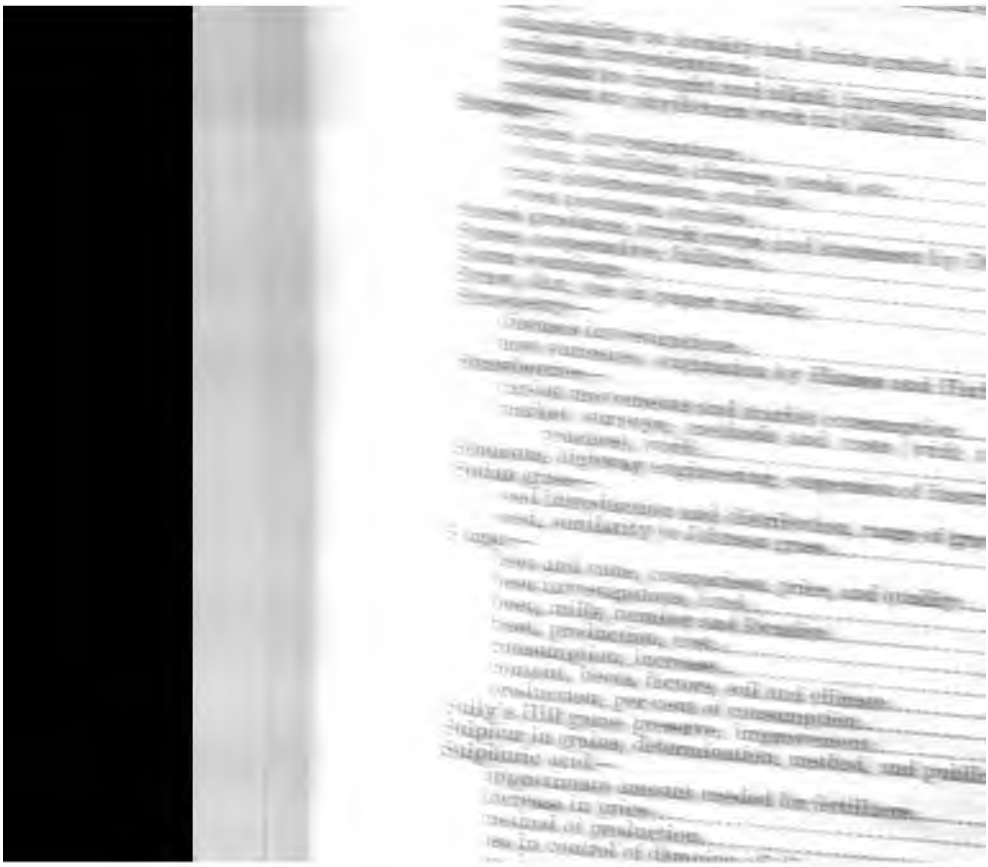

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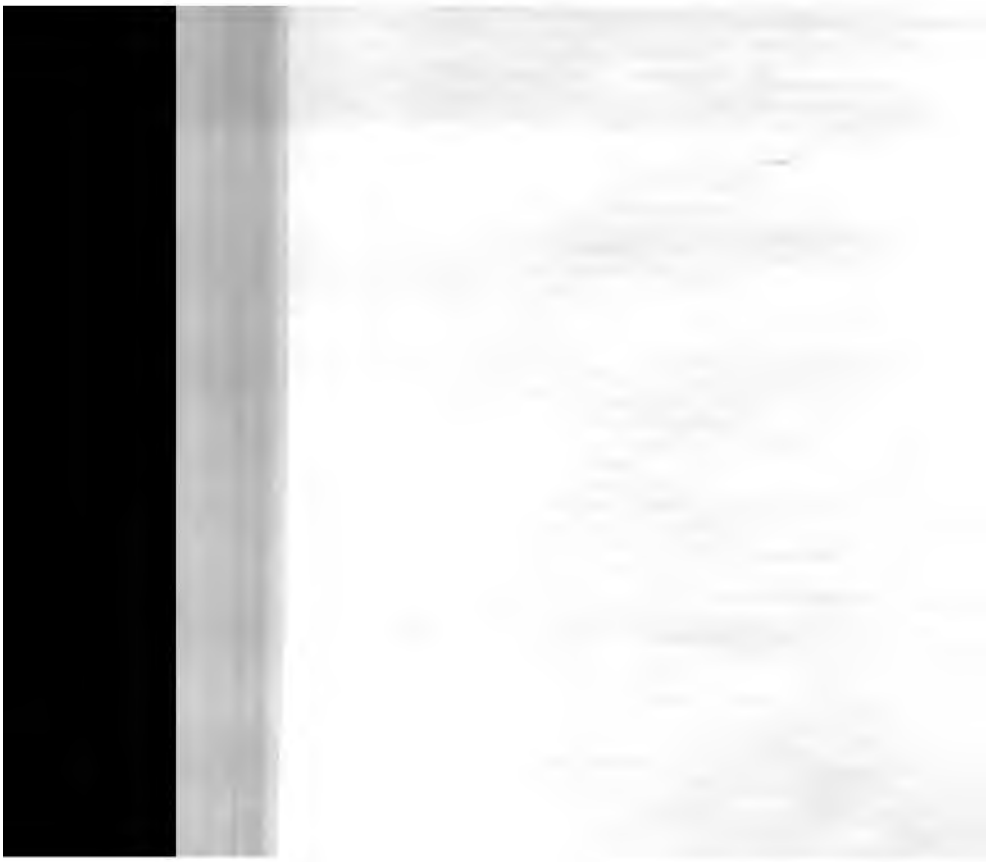

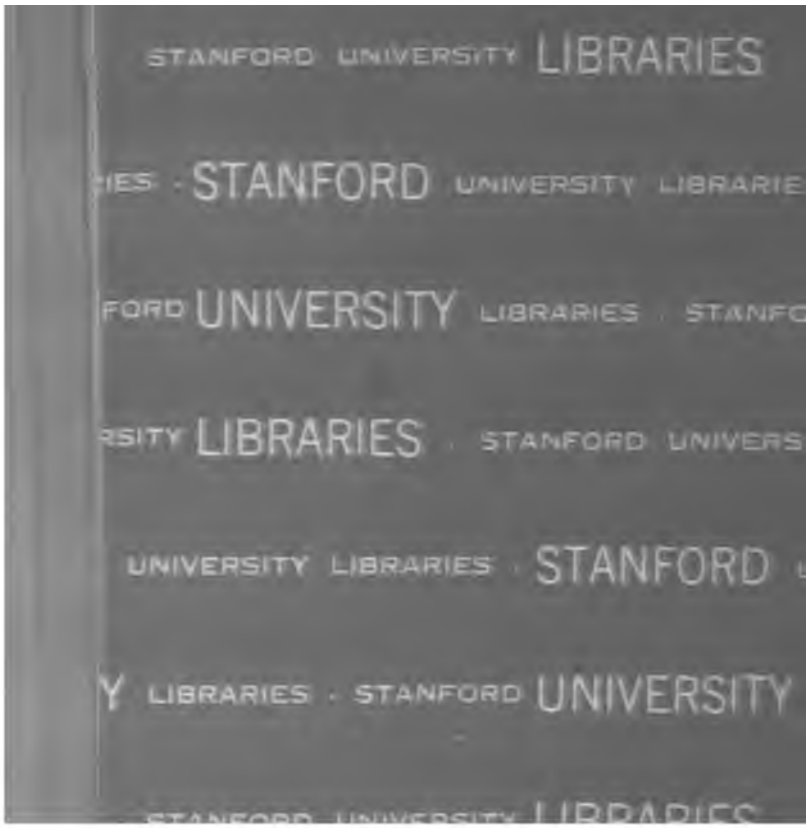
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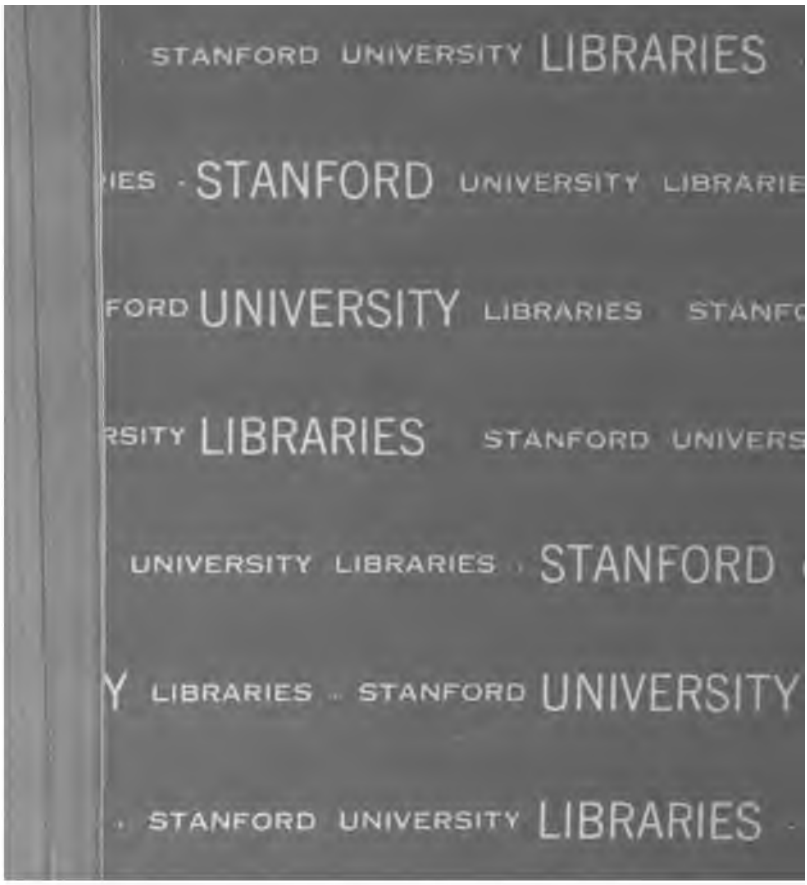
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